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ABSTRACT

Based on Bernhard Fabian's "Buch, Bibliothek, und geisteswissenschaftliche Forschung (The Book, the Library, and Humanistic Research)," this study is a commentary on the relationship between library and user. Discussing the characteristics and requirements of research in the humanities, it stresses the interrelationship between humanities research and the library. The work's ultimate purpose is to call attention to major gaps and shortcomings in Germany's bibliographical institutions with a view toward amelioration. The following chapters are featured: "The Library: Essential Institution for Research in the Humanities"; "Germany: An Example of Divided Bibliographic Responsibility"; "Since No Library Can Own Every Original Record..."; "Meeting the Assault on National Literary Resources"; and "Book and Journal as Media for the Humanities." (Includes and epilogue and 153 references.) (AEF)

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In Close Association: Research, Humanities, and the Library

Buch, Bibliothek, und geisteswissenschaftliche Forschung

(The Book, the Library, and Research in the Humanities)

By Bernhard Fabian

Translated and adapted by

John J. Boll

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Buch, Bibliothek, und geisteswissenschaftliche Forschung

(The Book, the Library, and Research in the Humanities)

By
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PREFACE

This paper is based on Bernhard Fabian's *Buch, Bibliothek, und geisteswissenschaftliche Forschung* (The Book, the Library, and Humanistic Research).[1] Discussing the characteristics and requirements of research in the humanities, Fabian stresses the interrelationship between, even interdependence of, humanities research and the research library. The work's ultimate purpose, however, was to call attention to major gaps and shortcomings in Germany's bibliographical institutions with a view toward amelioration. While Germany has enjoyed an excellent system of bibliographies for announcing both trade and nontrade publications, the records of library holdings are still considerably less than ideal, especially when interlibrary loan is required or when interdisciplinary work is involved.

The major topic—the symbiotic relationship between the research library and research activity—needs elucidation and translation into action. Although many of his discussions apply mostly to Germany, Fabian's original work is clearly important to American librarians and bibliographers. However, once the translation had been completed, it became obvious that the original work, while of great importance and even essential for German librarians, German donors of research funds, and students with topics that require bibliographic access to German library resources, contained large sections which are not of great interest to many American librarians and bibliographers. To mention two examples, a fairly large section of the original work deals with shortcomings of the German interlibrary loan system, and another section deals with the German method of publishing dissertations.

With Professor Fabian's approval, this work changes the original focus, omitting about half of the original while updating and adapting the rest so as to address American conditions and needs. In its totality, the current work presents a somewhat different picture than the original and serves a different purpose. However, the major thrust—i.e., symbiosis of the research

library, research resources, and research in the humanities—has remained the work's central theme.

The short account of bibliographic control of German library resources on the national level, for example, describes a model *not* to be followed. This seems particularly appropriate at a time when the General Accounting Office recommends that the Library of Congress downsize its mission so as to serve Congress rather than the nation. Will our bibliographic control of library resources become as scattered as the German model?

The thread running through the present work moves from resources—often unique originals—required for research in the humanities over to questions of their local availability, to substitutes for local availability, such as interlibrary loan or micro-collections and electronically stored resources. Libraries or groups of them need to assume the role of coordinating regional archives of the nation's literary output. The monograph and journal on paper will remain dominant, at least for humanities research. Although this idea may seem hopelessly antiquated to some, both authors believe, in the words of Bernhard Fabian, that the book in paper format is still "the ideal standard for publication in the humanities."

Readers interested in the degree of change between the original and the present work may want to know that about 45% of the present text represents a translation or edited translation of the original, about 38% represents new text, and about 17% of the present text incorporates ideas from the original in a new format with updating and generalizing from the German situation to the totality of library-research symbiosis. Of the original work, about 32% of the pages were omitted and about 36% were omitted as text, but the ideas were incorporated in the present work. Dropped were primarily historical descriptions of German attempts to create a national library or at least a national union catalog, discussions on the malaise of scholarly publishing, especially in Germany, and detailed specific recommendations on strengthening German research libraries, on improving their bibliographic control, and on reviving the academic publications process. Added were primarily sections on national libraries in Germany, copyright, interlibrary loan, text collections in microform and on CD-ROMs, on bibliographic utilities, and the recommendation for regional archival libraries.

John J. Boll

INTRODUCTION

This study is a commentary on the relationship between library and user. It attempts to view from a scholar's perspective the methods of supplying the literature needed for humanistic research.

One traditional library responsibility is to make scholarly literature available and accessible. The expectations that are connected with this concept help to shape the library image. Some researchers will view the library as a "service organization," describing its role in the scholarly world as a "service function," and seeing it as a technical institution that must supply users with literature. We view the library differently. We see in it the central institution for humanistic research. It has this role for two reasons: first, because text plays a primary role as research object in the humanities; and second, the humanities serve to nurture and to unlock the cultural traditions which meet and consolidate in the library more than in any other institution.

Library problems and problems of scholarly literature are closely entwined. Strictly speaking, they are two sides of one problem. Current library problems are not isolated technical problems but are problems with components that affect, and that were shaped by, theoretical research and the history of scholarship. Humanistic research depends on library effectiveness. While efficient libraries do not guarantee high quality research, certain institutional preconditions must be met so that the average researcher can produce useful studies, and the good researcher can produce excellent ones.

A type of library is needed that, analogous to a highly developed research laboratory, permits even intricate and delicate projects. Through the humanities, modern society has created the agent which can balance society's abstractness and lack of history. Viewed in this fashion, the humanities not only have the right to exist in modern society but to bear a vital function which becomes more pressing with every advance in the natural sciences and technology. The need for high quality humanistic research will increase and with it the need for suitable research facilities.

The library's role in the "Information age" is subject to considerable speculation, and its demise in a "paperless future" is frequently prophesied. From a humanistic perspective, the prospects look different. Not only is there hardly a chance that humanity's "paper memory," which the library is according to the traditional point of view, will be absorbed by an electronic

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memory. On the contrary, the library's tasks will expand in the future and will probably extend into areas that go beyond the supply of literature.

In their meaningfully titled *Future Libraries: Dreams, Madness & Reality*, Walt Crawford and Michael Gorman write:

> Libraries exist to acquire, give access to, and safeguard carriers of knowledge and information in all forms and to provide instruction and assistance in the use of the collections to which their users have access. In short, libraries exist to give meaning to the continuing human attempt to transcend space and time in the advancement of knowledge and the preservation of culture.[2]

In Crawford and Gorman's view, tomorrow's library will increasingly offer services to remote users as well as to users in the library; will and must be involved in innovative local and regional consortia to improve access and service; will and must use a combination of print-on-paper, electronic, and other media each in the application to which it is best suited; will have increasing access to materials not locally held in order to enhance, but not to replace, the local collection; and "will and must continue to maintain and build strong collections of print and other media, in order to serve the essential needs of their users."[3]

For the humanities, the book is a major, although not the only, research source and object as well as a medium of scholarly communication. Its characteristics and achievements are particularly noticeable from the perspective of electronic literature storage. Scholarly literature is in a state of crisis which is marked by a superabundance of literature on the one hand, and a dearth of means of publication on the other. Nevertheless, the constant growth of literature, which imposes great problems on libraries, will most likely continue.

Even in the future, the book will be indispensable for scholarly research. The problem is not how to replace the book through "modern" methods of publication, but how to maintain it as the central means of communication. In view of the overabundance of literature and the development of new media and methods of distribution, a new hierarchical structure of publication formats seems unavoidable.[4] Another prerequisite for maintaining the book is the use of new techniques for producing scholarly publications. Already existing or predictable changes in the physical production of literature will lead to a restructuring of the process of publication. The new responsibilities which will devolve as a result of this process on scholarly authors and their institutions will most likely also affect the scope of library functions.

THE LIBRARY: ESSENTIAL INSTITUTION FOR RESEARCH IN THE HUMANITIES

The availability of scholarly literature is a prerequisite for scholarly work. A venture beyond this trivial observation reveals insufficient recognition of the fact that scholarship makes diverse demands on literature which must, and can, be satisfied in various ways. Theories of library use exist, but there is no overall coherent theory of library use and thereby of the library as an institutional necessity for scholarship.

Customarily, we content ourselves with the monistic premise that it is a research library's task to secure *the* literature of scholarship. But the demands of scholarly work differ in different domains, and even within one domain they need not remain static. Since the needs for bibliographic resources are variable, expectations regarding the institutions that supply the resources cannot be uniform.

The spectrum of the requirements for scholarly literature evolves, however, not only from the sum of the individual needs. Specific needs depend on the structure of the research activity itself. There are typical methods of accessing the library as a literature reservoir, and that is especially true for the interrelationship between the library and humanistic research.[3]

The specific problems of supplying literary resources in the humanities evolve from the fact that, at least in its classic disciplines—philosophy, the philologies, and history—the written text is the primary, if not necessarily the only, research object and working tool.[4] In this respect, the humanities, including history, differ not only from the natural sciences, medicine, and technology, but also from the social sciences, which include, viewed from this perspective, psychology, pedagogy, and other disciplines. Here the text is generally not the immediate research object but only a supplementary resource as part of the scholarly process.

In fields other than the humanities, the demand is usually for modern research literature—i.e., for a body of literature that may be extensive but that is essentially homogeneous. It consists of monographs and journals with the common characteristics of a relatively recent date of publication and therefore mostly under bibliographic control. This literature archives the results of the research process. Ideally, it represents the consensus of achievements reached through common efforts. In the taxonomy which arises from the tradition of these efforts, it represents the current state of knowledge for an area or a discipline.

For these areas of scholarship, the library serves mainly, although not exclusively, as a mere warehouse. To use a metaphor, the library serves as a "larder of the mind"[7] from which the various bits of information needed for continuing a scholarly project may be taken as needed. In a more realistic than metaphorical sense, the library can be viewed as the "memory" of scholarship which is expected to remain optimally functional through continuous and, as much as possible, complete acquisition of literature.[8]

To fulfill its role, a library that specializes in providing literature for these areas of scholarship need not be a library in the traditional sense. The disciplines of the sciences and technology, like medicine, have at their disposal extensive and finely meshed bibliographic aids which, even in their printed format, are not limited to in-house use. Their databanks may be totally independent of libraries. Since their literature is used mainly to obtain information about a specific problem, these subjects demand only a literary storage center which archives and dispenses information conveniently. Even now, the availability of paper copies (generally of journal articles) and of full-text electronic copies decreases the importance of the conventional library as the exclusive locale for literary research and for the use of literature. In the future, the development of "electronic literature" may well aim—although one trusts unsuccessfully—at making the library totally dispensable. Unlike the research literature requirements of the sciences, technology, and medicine, which are structurally uncomplicated because of their concentration on modern research literature, the humanities display a different,-and structurally more complex, need for research literature. This difference and complexity results from the fact that literary texts in the broadest sense are primarily, and even exclusively, the subject of humanistic activity and research. Scholarly writing in this field relates as "secondary literature" to a "primary literature" of printed or unprinted texts with which it forms a tenuous literary continuum that is difficult to control bibliographically.

Most humanistic disciplines are historically oriented. This historical dimension is essential and, regardless of modern developments, it determines the classical humanistic approach to research. To the extent that research institutions and research techniques in other fields—e.g., in the social sciences—are affected by this historical dimension, they should be included among the humanities. This commonality is caused less by an affinity of subject or research method than by recourse to research that is based on textual tradition. The substance of the humanities, as Wilhelm Dilthey pointed out some time ago, "forms the historical and social reality to the extent that it has been preserved as historical tidings in humanity's

consciousness and has been made accessible to scholarship as social knowledge going beyond the present conditions."[1]

Potentially the need for humanistic literature extends to the entire universe of texts which, together, are a constituent part of cultural tradition. In whichever discipline, humanistic scholarly work is work in the tradition in which a text may be more or less significant but, because it is part of tradition, can never become so obsolete that it could be, or should be, eliminated. Works in the field of literature, and even music, are telling examples of this characteristic.

The library thus fulfills a different function in the humanities than in the natural sciences. Its task is not only to store and make available scholarly literature (seen in the narrow sense) for purposes of research, its function (and in many respects its primary function) is also to accumulate and present the resources that are required for the research process itself. Libraries make available for future use the source material needed for scholarly work as well as the existing products of this work. The library's "simple" storage function, as viewed from the perspective of the natural sciences, expands under humanistic premises and, in turn, gains a historical dimension. The library keeps the character of an archive of modern scholarly literature but, simultaneously, becomes a scholarship-serving archive of cultural traditions.

The library fulfills this double function best when it provides for the scholarly user a comprehensive resource collection, along with appropriate reference and bibliographic-access tools. Any imbalance in one direction or the other limits its usefulness to scholarship. A large stock of primary literature without the respective secondary literature is as problematical as a comprehensive collection of scholarly secondary literature without the original sources on which it is based. Although this may be an unachievable goal for many older libraries, it is axiomatic that the more a library's resources represent recorded knowledge—i.e., the richer its historical resources, along with an adequate supply of modern scholarly literature—the better prerequisites it supplies for scholarly work.

Accordingly, the natural sciences and the humanities require, for research purposes, different institutional support in the form of different types of libraries which cannot be made alike by the common denominator "scholarly library." That both are repositories of scholarly literature is a minor point. The inherently different roles which these two types of libraries fulfill in the research process are of far greater significance. A natural science library is primarily a depository of research results which are typi-

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cally retrieved as individual facts: "A scientific library is not primarily a quarry, nor a factory, but a store."[10] That does not prevent it from documenting scholarly tradition, primarily by including "classical" works in its holdings.

While it is also a depository of research results, the humanistic library is also much more: it is a reservoir of primary sources for research. Its holdings combine scholarly research literature along with the original works needed for humanistic research. Therefore, the humanistic library is not only a collection of literature but also the place for doing research. It is a combined reservoir and workshop.

The Scholar's Workshop

Fuzzy notions predominate about the library as a place for scholarly work. Frequently libraries, even scholarly ones, are viewed primarily as bookstacks whose major task is to act as a circulating library. It is not generally understood that a scholarly library can and must be more than that.

The difficulty of explaining the library's role as a place for research is, perhaps, the reason for the frequent comparison of the library with the laboratory. Such comparisons tend to call attention to the library's indispensable role in humanistic research rather than to its total function in the scholarly process itself. As Adolf von Harnack said long ago, while the needs of scientific and technical institutions can be clearly delineated, those of libraries are more difficult to explain.[11] Paralleling libraries and laboratories is mostly an attempt to transfer to libraries some of the self evident right to exist that has been granted to institutions in the natural sciences since the end of the nineteenth century.

Although the comparison may appear problematical, it is, apart from the pragmatic intent, quite suitable for illustrating the library's role in humanistic research if the analogy is explained cautiously. With respect to the researcher's procedures at the cutting edge, the natural sciences and the humanities have much in common. These common characteristics, and the institutional requirements deriving from them, are most effectively described from the viewpoint of the laboratory as the site for scholarly experiments.

The modern theory of scholarship has elucidated[12] that, as a rule, a hypothesis or theory is at the beginning of a process of discovery in the natural history realm. It represents a temporary concept that is checked against

empirical data with the goal of confirmation or rejection. If it turns out to be incorrect or insufficient on the basis of this comparison, it must be modified. This process is repeated until an incontestable explanation of the empirical data is achieved.

It is one of the methodological principles of modern natural sciences that, to confirm or to refute a theoretical assumption, one does not merely record a result that happens to occur. Rather, whenever possible, one tries to achieve verification actively. This is done by means of experiments. Whether done in the Kantian sense as a question directed to nature or according to more recent concepts as a "dialog with nature,"[13] the experiment is a conscious experience aimed at a specific result, an attempt to reach understanding through a definite plan.

An experiment's success depends not only on the quality of the researcher's theoretical—i.e., conceptual—work. It is also affected by the quality of the institution. The laboratory is not only the instrument but also the essential requirement that permits the actualization of research. It represents the material prerequisite that permits verification or rejection of a hypothesis and thereby the advancement of scientific knowledge.

Specifically, not any happenstance laboratory will do. It must be an appropriately equipped laboratory that permits the creation of the necessary experimental conditions. It may not lack what is needed for the experiment. Furthermore, everything needed for the experiment must be available at the moment of need. Nobody can expect successful research when the available equipment is deficient and when instruments can be obtained only during the course of the experiment without the certainty when and whether they will be obtainable at all.

It is part of the "clear delineability" of the requirements for natural science research that this interconnection is self-evident. The laboratory's role in the process of natural science research also shows clearly the inseparable connection between the intent of the research and the institution at which the research is taking place. The level of the institution's performance must correspond to the research intent.[14]

There are analogies with the humanities. Admittedly, in the humanities, knowledge is not gained through experiments, and the empirical basis differs because it is conditioned by the arbitrariness of historical tradition. But the procedural methods show that the most recent methodological theories question whether the distinction between natural history method-

ology and humanistic methodology can still be made as strictly as used to be the case.[15]

In the humanities, the researcher typically begins with a question in mind. This question has the same significance as the hypothesis or theory in the natural sciences. The historian Karl J. Weintraub has described the beginning and process of humanistic research as follows:

> The dominant motivation of a good scholar is his preoccupation with a question which he, with a constant methodological awareness, refines into sharper questions. The question is his chief tool for investigation. The quality of scholarship depends on the quality of the question. Hazy question, hazy answer; clear question, clear answer; dumb question, dumb scholarship.... In pursuit of tentative answers to his question, the humanist relies on heuristic devices, tools of discovery, such as "ideal-type" constructions, systematic conceptualizations, mental constructs that in his world may embody something like normative assumptions and notions concerning man's behavior, the categories of his mind, the character of his creations, like genres, for instance. These rarely have the sharp crispness and the logical clarity of scientific theories, but they may play a similar role. Guided by his question, he must determine the relevance and suitability, the reliability of his data. He cannot experiment on his data, but he may be able to run thought-experiments, think through the "if-propositions," and try to separate out, in a painfully tenuous sort of labor, the adequate causes of events.[16]

In a general sense, this is true for all disciplines. Like the hypothesis in the natural sciences, the humanist's question begins a goal-directed process in the course of which the relevant data will be found. In either case, the description conveys the image of a successive movement that leads from detail to detail.

In his reflections on the theory of scholarship, Sir Karl Popper contrasted different conceptions of the search for knowledge under the title "The Bucket and the Searchlight: Two Theories of Knowledge":[17] the view (usually combined with a naïve theory of induction) that in the human consciousness, observations accumulate automatically like in a receptacle and, the opposing view, that knowledge is shaped by goal-directed active observations. Apart from the theoretical problems which result from these two views, the second approach yields an appropriate understanding of the research processes in the humanities as well as in the natural sciences.

Since humanistic research depends on textual tradition on an empirical basis, the realization of a researchable idea—the pursuance of a formal question—demands an institutional apparatus which must be viewed as

precisely analogous to the laboratory of the natural sciences. Here, too, concept and institution are interdependent, and the research result depends on the quality of the research question as much as on the level of the reply which the library as institution permits. The comparison between the level of a laboratory's apparatus and the level of a library's literature "apparatus" is valid. Therefore, the richness and accessibility of library resources cannot be considered a mere incidental or marginal aspect of scholarly work—they are an essential requirement for research.

The Research Process and the Research Library

The completed scholarly publication furnishes an inadequate, and often even erroneous, picture of the actual research process. Research results must be verifiable and must also be capable of being integrated into a broader context. It is therefore necessary, and it is part of the conventions of scholarly communication to present them as the result of a series of cognitions which seem logically compelling, and which can be arrived at only in the sequence that has been used but none other. The research process is reconstructed according to an idealized pattern, and this reconstruction omits any reference to circumstances that could be considered as interfering with the inherent research logic.[18]

This highly stylized description hides the fact that research—far from being a straight linear process—consists typically of a series of groping "attempts." The first attempt seldom leads to the confirmation of a hypothesis in the natural sciences or to the formal answer to a question in the humanities. Usually research is a cumbersome painstaking task which requires many restarts. The process, which can be described theoretically as a more precise formulation of the hypothesis or as a refinement of the formal question is, in reality, a difficult and painstaking procedure.

When scholars express an opinion about research practices, which they rarely do, and then almost always in phrases that reveal the opposite of what is generally understood as research, a process that is as certain as it is consistent.

When a physicist plans an experiment, he or she begins with something that is—similar to a dream—not realistic, that has no really concrete shape but represents for the researcher the sum of the desirable and the possible. Physicists begin with a utopian scheme. Before they execute it they must think again, cautiously, realistically; much will not be possible, or not yet possible, and much will be changed during the experiments. Nevertheless, the utopia is a very important step.

These are the words of the physicist Heinz Maier-Leibnitz as president of the *Deutsche Forschungsgemeinschaft* (German Research Association).[19] In his *Historik*, Johann Gustav Droysen wrote:

> The historical question provides for us initially only a possibility, a glimmer in our soul, a hope. It is a question of whether things really were as we surmise hesitantly, whether they can be proven. One will set about searching for the necessary resources, to study them with this question in mind, to see whether the thought that we surmised will be confirmed. And as it develops ever more profoundly, as it is refined, it changes. One is in danger of losing it or of seeing it crumble.[20]

Hypothesis and formal question must therefore be considered as sketchy drafts, as subtle constructs whose derivation and characteristic are disclosed through psychological, rather than logical, analysis.[21] In their development methodology and intuition, logic and fantasy blend insolubly. It is no accident that, in the natural sciences as well as in the humanities, the "art" of research is emphasized—e.g., by the English pathologist W. I. B. Beveridge in *The Art of Scientific Investigation*[22] and by the literary scholar Richard D. Altick in *The Art of Literary Research*.[23] Both emphasize, although in different ways, that the research process is affected by subjective factors that depend on the researcher's personality.

Since they are the researcher's "ideas," hypothesis and formal question are something that is incalculable; they are an unknown factor which nevertheless permits the transition to the new, to the so far unknown. Viewed from this perspective, the fundamental uncertainty of the research process is not something negative that could be avoided by careful planning but something positive without which the progress of knowledge would be impossible. The history of discovery provides historical proof for this statement.[24]

On the other side of this coin is the complementary category, the accident, the chance. Almost every attempt to conduct research on the basis of a hypothesis or a formal question encounters the unexpected. In the humanities, this factor of surprise receives a special component through the fact that the empirical data usually show gaps and, unlike in the natural sciences, cannot be "produced" or can be produced only in limited fashion.

The consequences which result from this for the research institution are far reaching. Since it is the humanist's laboratory, the research library must be attuned to the precarious nature of the research process. It must permit the researcher to check spontaneous notions against the empirical resources with the greatest possible efficiency. Furthermore, it must enable the researcher to pursue a question through the primary and secondary litera-

ture, regardless of where this search will lead. These requirements are expressed by the simple formula: "The best library is that which is prepared for most emergencies."[25]

It is the willingness to be prepared for the exceptional case, which is the standard case in research, that distinguishes the research library from the ordinary scholarly library. Neither quality nor quantity of literature needed is predictable—unlike, for example, in a library attuned to academic instruction. "Inherent in research, because it is poised precariously at the frontiers of knowledge, are unpredictable demands for information which would further its direction or lead it into more fruitful paths. As a consequence, research requires access to comprehensive collections of material that include and would preserve the seemingly irrelevant and unimportant."[26]

Ernst Robert Curtius's *Europäische Literatur und lateinisches Mittelalter*[27] furnishes a direct example of a research process in the humanities. In the Introduction and in the Epilogue of this book one can perceive not only the technique and the tactics of the researcher who proceeds with almost artistic sensibility (Curtius demands "a highly differentiated receptiveness which "recognizes" essentials),[28] but also the essential institutional basis of a comprehensive stock of literature. In a correct assessment of this situation, the art historian Sir E. H. Gombrich commented similarly that, from the point of view of research, the division of the humanities into disciplines becomes irrelevant and should therefore be annulled. Practical experience confirms this point: "The alert readers of any text must inevitably ask questions which will take him into linguistics today, into history tomorrow and probably into social studies next week."[29] In other words, interdisciplinary research.

The tentative character of scholarly discovery in its developmental phase suggests going beyond viewing the library as a "storehouse" and as a "workshop," but viewing it in a special sense also as an instrument for advancing scholarly understanding. To reach this understanding, it is part of the clarification process that researchers "look about" in the literature. That means, they use the literature of their own field, and usually also of other fields, in an unsystematic way in order to stimulate their own thinking.

In addition to searching the literature in an organized way, researchers also tend to use serendipity to find suitable resources by chance.[30] The value of this process is frequently argued, and some theoreticians believe that this is an activity unworthy of being part of the research process.[31] That argument fails to recognize that this exploratory use of the literature does not take the

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place of systematic reading but supplements it.[32] Through it, the suggestive strength that a large library has for the researcher comes into play.[33] Stated differently: The availability of a comprehensive and immediately accessible literature reservoir is one of the best opportunities for aiding humanistic research indirectly but very efficiently.

When push comes to shove, faculty want materials on campus. They don't want to be dependent on other distant libraries for needed materials. Many of them also, because of the structure of their disciplines, still depend on at-the-shelf browsing. Efforts by librarians to de-emphasize ownership are interpreted as a failure to understand both the political environment and legitimate differences in research methodologies among disciplines.[34]

English library science literature furnishes this argument:

> The . . . type of browsing . . . most undervalued and least understood . . . is the exploratory, semi-purposive browsing of mature scholars among the stocks of large, familiar libraries. Although not seeking material on any particular topic, the reader maintains a reasonable expectation of some intellectual reward in the long run. He hopes that ideas will be stimulated, and his imagination fired, while knowing that the generation of such ideas is largely unpredictable. . . . Such continuing self-education is invaluable but not subject to prior evaluation. The results include the broadening of subject boundaries and a general enrichment of the quality of knowledge.[35]

The only deduction to be made from the above is that the ideal research library is a universal noncirculating library like the Library of Congress and the Research Library of the New York Public Library. It alone fulfills the requirements of the research process in a fashion that justifies use of the expression "optimal conditions." It alone provides the institutional guarantee that the researcher can work efficiently thanks to the available resources.

A Pioneer Among Research Libraries

The history of the modern research library begins in the eighteenth century. The Göttingen University Library of 1737 is generally acknowledged as its prototype.[36] This was the first attempt to go beyond the traditional scholars' library and to create a literature reservoir of a size and character appropriate, even at that early date, to research in the modern sense. Historically, the creation and rise of the Göttingen library must be viewed in the context of the scholarly movement that spread over Europe in the late seventeenth and early eighteenth centuries, which changed basically the ways

of thinking and the intellectual process and procedures. The Göttingen library was literally the first exact institutional solution for the demands resulting from this intellectual movement for the library to be a repository of scholarly writings as well as an instrument for scholarly work.[37]

The Göttingen library was conceived as a universal library; it included virtually all disciplines that were significant for that age. Furthermore, and this was the new element, it took the research process into account. Research was considered here not as a single act of discovering the truth but as a continuum of attempts whose results the library had to store. The systematically planned collection represented "the ever progressing scholarly culture"[38] and thereby gave its patrons the possibility of discovering the respective state of knowledge and to contribute to its progress. The library benefited from having a sufficient budget for systematic acquisition of new publications and for planned buying of older works, and it had liberal usage regulations. It also was connected to the *Königliche Sozietät der Wissenschaften* (Royal Society of Sciences) and published the *Göttingische Zeitung von gelehrten Sachen* (Göttingen Journal of Learning).[39]

Göttingen's role as the leading eighteenth-century research library was aided also by convenient access to its collection. Alphabetical author catalog as well as a systematic subject catalog provided bibliographic access which is one of the great achievements of the eighteenth century in the realms of classification of knowledge and of library science. Göttingen also had liberal usage regulations and developed somewhat later a solid link between shelf arrangement and the catalog.[40]

Both multiple-access catalogs and reliable links between the catalog and the actual works are prerequisites for research and other library use. Embryonic and rather awkward examples of links existed as early as the fifteenth-century, such as at Durham and Queen's College in England.[41] In the sixteenth and seventeenth centuries, a few bibliographers created or recommended multiple, rather than the traditional single, access bibliographies and library catalogs, such as Conrad Gesner (1545), Florian Trefler (1560), and Gabriel Naudé (1644).[42] But they were not common, and the eighteenth-century Giessen catalog represents a major advance.

By the turn of the eighteenth to the nineteenth century, the Göttingen Library occupied a unique national and international position as an institution that enabled exceptional scholarly achievements. It was unquestioned as a model for the research library of the future, and it served for many institutions as an orientational guide. The implications that had to be

drawn on the basis of the library's rapid development and on the basis of the evident success of its system of making available a highly developed research potential were, however, drawn abroad rather than to Germany.

For German libraries, the years from about 1820 to about 1880 were a period of stagnation. Göttingen lost its leading position. Its accessions and administration deteriorated. While some centralization of resources occurred, such as the gathering of superb resources in Munich as a result of secularization,[13] during all of the nineteenth century "no [German] library could claim to be as complete as Göttingen had been during the second half of the 18th century."[14]

The discrepancy between the nadir of academic libraries and the impressive research of the time is primarily due to the existence of scholars' private libraries.[15] However, during the second half of the nineteenth century, the rapid increase in literature production began to make it impossible for scholars to own personally the works needed in their own and related areas.[16] The acquisition of the literary apparatus needed for teaching and for the nurture and growth of scholarship became a public responsibility. The modern era of national support for scholarship began. In Germany it was impeded by insufficient governmental vision and by the fact that a discipline that depends on inclusive comprehensive literary resources with good bibliographic access confronted a library system that had been inadequate for more than half a century.[17]

In several other countries, particularly in England, the situation was entirely different. Within a few decades, the Library of the British Museum achieved the status of a national library and of a scholarly library of international significance.[18] Sir Anthony Panizzi used the Göttingen library, which he knew personally, as a starting point for his development plans.[19] Thanks to its functional 1857 building, its liberal collection policy, and its printed catalog (1881-),[20] the British Museum in turn became a model institution. This development had as little repercussion in Germany as had the no less significant development of the national libraries in France and in the United States.[21]

This was the result of historical realities. Before 1871, Germany consisted of many semi-autonomous states, each with its own sovereign, at one time even with its own weights, measures, coins, and stamps—and most of them also with their own state library which was often also the university library. In other words, Germany had, before 1871, neither a tradition of, nor an overwhelming desire for, one central research library. Instead, it had in 1871 a relatively large number of uncoordinated state and academic libraries of

varying strengths and emphases and sometimes very good but highly selective and localized or regional subject coverage. Many of these libraries have, at least to some extent, continued in their roles since then, although the government, boundaries, and names have undergone profound changes. This scattering of relevant resources does not facilitate research in the humanities that depends on large stocks of resources in one location or in a number of coordinated locations. This situation continues essentially today since, like in the United States, educational matters, including library matters, still are primarily state rather than national responsibilities and the various state ministries of culture exerted and exert a strong influence on the educational system and on cultural agencies such as libraries—more so than in the United States.

Deficient Assumptions—Deficient Research?

Little precise knowledge exists about the interrelationships between scholarly institutions and scholarly achievements, and it is questionable whether general conclusions can be reached about them. Recent attempts to measure research activities and achievements quantitatively do not clarify these relationships. They are limited to designing measurements for comparing individual achievements.[52] The question of what the likely or necessary institutional prerequisites are supposed to be that will encourage research achievements is, typically, not asked.[53]

The current belief regarding the relationship between researcher and institution gives the scholarly personality primacy. Using examples from the history of research, which illustrate the researcher's success even under negative institutional conditions, it postulates the researcher's independence from the institution: capable researchers will reach their goal even without a supportive institution. Even if this may apply in individual cases, this hypothesis overlooks the fact that more examples exist that prove the contrary, that is, scholarly success as the result of cooperation between person and institution. In ideal cases—and this proves the opposite point of view—the institution even exerts supportive pressure on the research: It provokes the researcher into special achievements.

This discussion is not intended to examine the entire spectrum of these interrelationships. Against the perspective of the historical background of German scholarly libraries and the distribution of their resources, I only want to indicate that, when institutional preconditions are deficient, deficient research results can occur that can be noticed, although they may not be directly "measurable."

GERMANY: AN EXAMPLE OF DIVIDED BIBLIOGRAPHIC RESPONSIBILITY

The National Libraries

Germany as a nation has a century-old tradition of a fine system of announcement bibliographies while neglecting storage and preservation of a good deal of her own historical national written output. The various efforts to create an archive in the form of one national library did not founder dramatically but simply evaporated. A few libraries, however, have individually taken responsibility for certain segments of the domestic literature, sometimes major (like the Bavarian State Library in Munich), sometimes very small and specialized ones. An example of the latter is Karl Immermann, an early nineteenth-century author: About thirty-five of his works were published shortly after his death in ten different cities. On the basis of the German regional depository regulations, these works are distributed among six or more depository collections, all of which a researcher most likely would have to contact to study Immermann's *oeuvre*, if the Heine-Archive in Düsseldorf had not made a specialty of him.[34] Friedrich Heinrich Jacobi, a contemporary of Goethe's, is less fortunate. His works were also published and deposited in several libraries, including several now located in Poland and Russia, but no German library collects his works systematically. As a result, the researcher interested in Jacobi depends on international interlibrary loan, not an ideal situation.

When the German Empire was formed in 1871, the Königlich Preussische Bibliothek (Prussian Royal Library) in Berlin was to take on the role of a national library, but since it was not legally entitled to be the national depository, it could fulfill only to a limited extent one of the obvious missions of a national library—collecting German book production on a national basis. The library had been well run as the *Preussische Landesbibliothek*, but its resources of both foreign and German literature were totally unequal to the increased demands of a national library or of a research library of international rank.[35] The reasons were insufficient funds[36] and a collection policy limited by the governmental decree of 1885 to collecting "German literature *as completely as feasible* along with an *appropriate selection* [emphases supplied] of foreign literature."[37] According to research done in 1912, it lacked at that time about half of the older, and also one-third of the then most recent, German writings.[38]

A major improvement in the bibliographic control of at least twentieth-century domestic publishing was the establishment in 1913 of the Deutsche Bücherei (German Library) in Leipzig as the depository for all *current* na-

tional German book production and as the national bibliographic center for twentieth-century national production. While also collecting some current literature, especially under the Prussian (state) depository laws, the Königlich Preussische Bibliothek (Prussian Royal Library), renamed after the establishment of the Republic the Deutsche Staatsbibliothek (German State Library), continued to be primarily responsible for as much of the older German book production as it could afford.

After World War II, Germany was divided into two countries (effectively in 1945, legally in 1949): the German Democratic Republic, referred to in the West as East Germany, and the Federal Republic of Germany, commonly referred to as West Germany. Because of mutual mistrust and national pride, both countries felt it necessary to have their own national library institutions, one each for older literature, and one each for current literature. For older literature, each Germany kept that part of the Deutsche Staatsbibliothek's collection that had been evacuated during the war to what became its territory. West Germany named its part of the collection first the Westdeutsche Bibliothek (West German Library), later the Staatsbibliothek Preussischer Kulturbesitz (State Library Prussian Cultural Property) and housed it first in Marburg and later in West Berlin. East Germany kept the name Deutsche Staatsbibliothek for the share that was in its territory in East Berlin. Both collections were fractured; neither was as useful to the researcher as the combined collection had been. To cite one of many resulting idiosyncrasies, one-half of the original manuscript of Bach's *Matthäus-Passion* was in the Deutsche Staatsbibliothek in East Berlin, the other in the Staatsbibliothek Preussischer Kulturbesitz in West Berlin. Nevertheless, these two archival collections contained considerable amounts of, but by no means all, older German literature.

When the two Germanies re-united in 1990, the two libraries merged administratively under a new and even longer name, Staatsbibliothek zu Berlin Preussischer Kulturbesitz (State Library in Berlin Prussian Cultural Property). It was decided to keep the older, mostly noncirculating, collection in the old building in the former East Berlin, while concentrating the literature from 1956 on in a circulating collection in the new building in the former West Berlin.[39] While this division causes problems for researchers in the humanities and the social sciences, it is understandable from a library administrative point of view. Also, that the entire collection is again accessible to researchers from all of Germany is an enormous improvement.

Both East and West Germany also had institutions responsible for current German literature: in East Germany, the Deutsche Bücherei in Leipzig continued after 1945 to be the archival collection for all current German

literature since 1913. In West Germany, the Deutsche Bibliothek (German Library) in Frankfurt am Main was created in 1946 as the West German national bibliographic and archival center for all German publishing output after 1945 along with related duties.[90] Each library published a current national bibliography of both Germanies' literary production with some exceptions. Since reunification in 1990, the two libraries merged under the name Die Deutsche Bibliothek (The German Library). Both sites continue as national legal deposit libraries for current German literary output but, since they divide their acquisitions and bibliographic activities on a geographic basis, are really large-scale regional depositories. Together they publish one national bibliography.[91]

Central Subject Libraries

The two national libraries (in four locations) are supplemented by a system of special subject libraries with national responsibilities. To simplify and accelerate the provisioning of research literature in the disciplines of medicine, technology, applied natural sciences, and economic and agricultural sciences, four central subject libraries were created in the 1950s and 1960s, one per broad subject. They concentrate on nonbook trade items on worldwide current literature; they provide active information services, index journals, and supply translations; they provide interlibrary loans at great speed within a wide topical scope.[92]

The Technische Informationsbibliothek, TIB (Technical Information Library), established in 1959 in the library of the Technische Hochschule (Polytechnic) in Hanover to cover technology and its underlying disciplines, especially mathematics, physics, and chemistry. The Zentralbibliothek der Landbauwissenschaft (Central Library for Argricultural Sciences) established in 1962 in Bonn in the Agriculture Library of the University of Bonn to cover agriculture and related sciences. The Zentralbliothek der Wirtschaftswissenschaften (Central Subject Library for Economics) established as such in 1966 in Kiel, which had really fulfilled the same functions for years as the library of the Weltwirtschaftsinstitut (Institute of World Economics); The Zentralbibliothek der Medizin (Central Library for Medicine), established in 1968 in Cologne, is part of the medical section of the University of Cologne which developed from the Library of the Academy for Practical Medicine established in 1908.

These central topical libraries work well indeed but, except for the Zentralbibliothek der Wirtschaftswissenschaften (Central Subject Library for Economics), they emphasize and deal with disciplines whose literature has a short "half life"—i.e., the natural sciences, technology, medicine, and

agriculture. For these, primarily current literature is needed which would, however, be only part of the literature necessary for research in the humanities.

A central library with the mission of collecting current humanistic literature would, therefore, be only partly useful as a place for research in the humanities and as an interlibrary loan agency.[53] This is why the decision reached for the largest German Library, the Staatsbibliothek zu Berlin Preussischer Kulturbesitz after the two Germanies reunited in 1990, to separate its resources on a chronological basis is not ideal from a humanistic research point of view.

Divided Deposits

Preservation of the national literary output is closely connected to the principle of the required depository copy, that is, to the required delivery of printing and other intellectual products to libraries as stipulated by law. The depository privilege of a central library was and is a major element to help make that library, in effect, an archive of national literary production.

Beginning in France, to some extent a part of censorship, publishers had to deposit as early as 1536 a copy of every printed work (dépôt légal). The first German equivalent was the Bavarian decree of 1663 which required the free deposit of printed works in the Royal Library in Munich.[54] In 1668, deposits began in Brandenburg, Prussia, and a decree of 1789 pointed out, like its French original, that deposit of books in the Royal Library in Berlin was "for the benefit of this library and of scholarship in general. . . which, as is well known, is aided considerably by a complete, well arranged, and generally accessible book collection in the capital."

The rapid increase in nineteenth-century book production led in most European countries either to the introduction of laws which decreed that books be deposited in national or state libraries or to the enforcing of previously disregarded laws. Especially in England, Sir Anthony Panizzi insisted on strict conformance with the depository laws as part of his effort to build up the library of the British Museum.

In the United States, Ainsworth Rand Spofford was the first librarian of Congress (1864-1897) to pursue "the goal of a truly national library and developed the collections accordingly."[55] Revision of existing legislation in 1865 and 1870 enabled him to enforce the copyright laws and to take over copyright deposits accumulated by the Department of the Interior and the district courts as well as the library of the Smithsonian Institution. The

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Library of Congress collection grew from 82,000 volumes in 1865 to 237,000 volumes in 1870. (As an aside, despite Spofford's efforts, the Library of Congress is still not a true national library, either on the basis of its mission as defined by law or on the basis of its activities. The functions of a national library are still divided between several federal and private libraries and even between the federal government and private enterprise.)

By the middle of the nineteenth century, almost all German states had depository laws which caused books to be deposited in their own state libraries, but there was no uniform nationwide regulation or enforcement. Nor did the Reich Press Law (Reichspressegesetz) of 1874 provide such a consolidating influence. It regulated for the first time commercial publishing on a national basis and established limited freedom of the press, but it left all state laws regarding deposit in effect.[66]

Even today, the depository privilege remains with the various German states. As a result, on that level of deposit, the national publishing output is scattered, sometimes among more than one library per state. Deposit can be, for example, by district within a state with further separation into trade and nontrade depository collections.[67] (This is reflected in a large number of regional and district bibliographies.)[68] These deposits include some items that were not, or could not, be controlled nationally—i.e., by the institution that receives deposits from the entire nation: Die Deutsche Bibliothek, divided between Leipzig and Frankfurt am Main.[69]

Since the various archival depository collections are not legally required to be noncirculating, the regionally deposited items are available for intra- and inter-regional interlibrary loan. This undermines the underlying purpose of the depository copy as an archival permanent copy.[70] Because many German libraries are undersupplied with recent German literature, it is in great demand for interlibrary loan. This means that researchers must first of all know where a desired item might be deposited and, second, wait their turn. Furthermore, the uneven distribution of publishing houses causes some depository libraries to be unduly burdened. There is no single national depository for German language book production from the beginning to the present.

Distributed Specialization and the Scholar

The above-described depository system which scatters German literary production, including research resources, primarily on the basis of origin, is augmented by two other systems which scatter German language resources, and in particular research resources, on the basis of subject, discipline, or

language. Regardless of the quantity and quality of the resources in any one library, specialized German language literature for research needs is made available through a system of special subject collections (Sammelschwerpunkte) whose theoretical foundation is the individual subject or discipline. These collections are located in different libraries, such as the special collection for history (Bavarian State Library, Munich), or Romance literature (University Library, Bonn), or philosophy (University Library, Erlangen). In many ways this system corresponds to the traditional subject divisions of academe, a circumstance which sanctions this very system.

For research resources in foreign languages, the Deutsche Forschungsgemeinschaft (German Research Community)[1] introduced in 1949 the Sondersammelgebiets-Plan (Super-regional Special Subject Collections Plan). This plan supports selected research libraries in their purchase of foreign language resources in certain subjects or disciplines. In view of the humanist's need for historical literature, it is important to note the limitation: this subject responsibility applies only to literature published since 1949. The humanistic research literature created from the beginning of printing to the nineteenth century, as well as the literature of the early twentieth century, is housed in virtually uncoordinated fashion among the various German research libraries with two added limitations: (1) the supply is insufficient, mainly because of major gaps; and (2) as will be explained later on, it is far more difficult for German researchers to locate these scattered resources bibliographically than it is for American researchers.

The improvement of local resources, which was achieved in the former West Germany, especially during the last 20 years, has not kept pace with the increasing needs. In the former East Germany, the supply of non-German literature is still woefully inadequate in spite of massive financial infusion. In many places the local resources are therefore insufficient, and a complicated and jam-prone interlibrary loan system must be used not only in exceptional cases but as part of the "standard system" of providing resources.

Scholars can have a relatively easy relationship to this system of regional and subject specialization as long as they remain within the respective subjects or disciplines, however defined. The research-supporting activities of the Sondersammelgebiets-Bibliotheken (Super-regional Foreign Language Special Subject Collection Libraries) have very positive aspects. Indeed, the German system has been copied in other countries—for example, in France and Sweden.

The counterperspective, however, reveals also some negative aspects. The system's clearly marked subject borderlines can provide guidance, and therefore limitations, even in areas where, in the interest of scholarly progress, a less defined borderline is desirable. Every conventional classification system has this disadvantage. Similar disadvantages exist within individual subjects and disciplines. If these are organized according to the schemes of standard reference works, a system of viewing a topic is encouraged that can impede new insights.[72]

Naturally, the effect which the West German literature supply system has on individual research projects cannot be evaluated easily. In general, however, it is likely that projects which lie within conventional subject borders enjoy better institutional support than projects which transcend these borders. Distribution on the basis of subject results inevitably in building collections with a subject core, and the closer a project is to the core of a particular library, the greater the likelihood that the library can provide adequate resources, be it in the use of reference works or in supplying interlibrary loans directly from the owning library.

Viewed schematically, the German scholar is in a system of circles, the Sondersammelgebiete, which are contiguous, sometimes overlap, but still represent distinct separate spheres.[73] The system as such has no overall center, and every circle has it own specific structure. Any distance from a subject "center" increases the difficulties of obtaining information and literature. This is even true for projects which can be considered interdisciplinary only in the traditional sense. A simple example from the history of literature: writing about the sonnet as a European literary phenomenon requires, even if one considers only Western Europe, the use of at least four Sondersammelgebiets-Bibliotheken: Bonn (Romanistics), Frankfurt (Germanistics and general science of literature), Göttingen (Anglistics), and Münster (Dutch literature). The same situation applies to a much greater degree to research projects that deal with modern "problematical" topics.

The question arises whether the German system of segmenting the research literature does not favor working within a specific subject and discipline. Also, whether the frequent necessity of borrowing the literature bit by bit, which forces the researcher to work with a bibliography, item by item, one after the other, might not create a research climate in which the sequential examination of individual sources, one after the other, becomes standard procedure even if they do not have to be obtained by interlibrary loan. There has been recently an increasing number of complaints about the

conventionality of humanistic research in Germany.[74] One should at least consider whether these are not factors that foster the conventional rather than the nonconventional—along with others which cannot be considered here.

There are signs that the system, because of its nature, at least seems to work against the unconventional researcher. Researchers who pursue a question that goes beyond an individual subject or discipline are, first of all, not "taken care of" by an adequate literature supply. Furthermore, the system often remains closed to them because it does not provide the range of information and bibliographic access which its complexity demands.

A simple example is Wolfgang Schivelbusch's *Geschichte der Eisenbahnreise: Zur Industrialisierung von Raum und Zeit im 19. Jahrhundert*[75] (History of Railroad Travel: The Industrialization of Space and Time in the 19th Century). This topic requires a wide and manifold literature supply. The preface contains this revealing comment: "The following American libraries permitted an examination of literature *that would not be possible in Germany* [emphasis supplied]: Library of Congress, New York Public Library, New York Historical Society, New York Academy of Medicine, American Railroads Association Library, Boston Atheneum, Kress Rare Books Library (Harvard)." The book's theme is not American, but its method of presentation shows clearly an American influence. If the book had been researched in Germany, it would be different. It might have been researched in Germany if the literature there were accessible through a better bibliographic apparatus.[76]

Many examples exist of the use of German libraries by foreign scholars. But, conversely, the last few years have seen increasing indications that German scholars of the humanities use foreign, and primarily American, libraries even for themes that are not so special or so farfetched that the use of foreign libraries seems essential.

Some original and interesting projects in a variety of topics indicate the use of foreign libraries—sometimes by means of surprisingly oblique statements in the preface, which suggests the conjecture that the immediate availability of literature offers definite advantages over the technique of supplying literature by means of presumably convenient interlibrary loan, and that the scope and density of the resources of leading foreign libraries permit a continuity of intellectual discovery that otherwise cannot be achieved or can be achieved only with difficulty. This is especially obvious in the case of projects whose theme can be placed only with difficulty into a specific subject structure, or which combine several areas in an unusual manner. While

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the amount of available literature is undoubtedly one factor, accessibility seems to be even more important. What is needed is the immediate access. When dealing with a topic, the researcher depends on an immediate response, an echo from the literature and, whenever possible, goes to the place which offers this response best.

Bibliographic Control?

It must be obvious by now that the system for supplying literature for research in the humanities in Germany is complex. Not only is the basic reservoir of literature extremely decentralized, with its structured and unstructured components, it is also difficult to access because a direct approach to the literature that supplements the local collection is only possible within a narrow geographical sector.

Since the German national literary output could not be collected in one central location, attempts were made, beginning in 1884,[77] at centralized bibliographic control by planning a union catalog of the holdings of the Prussian, later revised to all German, academic libraries and the Austrian National Library. Delayed by World War I and inflation, the first 14 volumes, covering "A" through "Beethordnung" were printed by 1936. The rest of the catalog, in manuscript form, is missing since the end of World War II.[78]

In lieu of a central union catalog that would help to orient and direct interlibrary loan, there exists now seven regional union catalogs, largely still on cards, which require different access techniques, are not coordinated, must be used one after the other, and are not really intended for public access, although some parts are available in microform and others are being put online. They are useful but, in the opinion of the Deutsche Forschungsgemeinschaft, "no viable alternative to a central German union Catalog."[79] Suggestions that they be cumulated were not implemented for financial and technical reasons.

Efforts toward a national union catalog, although unsuccessful in the past, are continuing but meet major obstacles—e.g., in the now reunited Staatsbibliothek zu Berlin Preussischer Kulturbesitz, alone for the main collection, two machine-readable and six conventional catalogs are being simplified and combined,[80] a task not yet completed at the time of this writing.

Because of the lack of one central union catalog, a German researcher can receive a summarized as well as detailed idea of, for example, the worldwide effect of the German pedagogue Joachim Heinrich Campe (1746-

1818) only by consulting the *National Union Catalog*, the *National Union Catalog: Pre-1956 Imprints*, and/or utilities like OCLC or RLIN. In this effort, the researcher will be aided by the fact that most German research libraries can now access RLIN via the Internet.

SINCE NO LIBRARY CAN OWN EVERY ORIGINAL RECORD... INTERLIBRARY LOAN PATTERNS

Literature supply systems can be classified by their complexity.[5] The simplest and most effective form consists of a sufficient supply at the place where scholarly work is being done. For research in the humanities, this is most likely a major national library like the British Library or the Library of Congress, or a research library that specializes in one or more humanistic areas like the Huntington or Newberry libraries. The common denominator of these immediately accessible collections is their virtual independence from any kind of interlibrary loan.

Local collections can be supplemented by interlibrary loan according to four models. The first is characterized by one central interlibrary loan library. This library is the reservoir for all, or most, interlibrary loans. Users address their interlibrary loan requests to a single agency which fills them either directly or via an intermediary library. The second model is characterized by concentrating the literature that is available for interlibrary loan among a few libraries. Among themselves, these libraries divide the task of owning the necessary source materials. In this case, the users, or the requesting library, must use several sources to fill their needs, but if the literature is divided by topic or format (such as monographs and journals), the requestor hardly meets greater difficulties than with the first model.

The third model, the decentralized system, is characterized by dividing interlibrary loan responsibilities among a rather large, or large, number of libraries. Each takes on acquisition responsibility within a very narrow field. Although responsibility for specific topics can be regulated in such a system, the difficulties of delineating the individual topics increases with the number of participating libraries. Furthermore, continuity of acquisition is assured only through the use of "classic" topics or disciplines. The more complex such a system is, the more limited is the user's likelihood of receiving the desired literature directly. One or more coordinating agencies could become necessary.

Unlike the third model, the fourth one employs a high degree of decentralization and only rudimentary, or no, organized division of responsibili-

ties among the libraries. In this case, decentralization is without a guiding plan; it is characterized by chance and thereby symbolizes the move from system to lack of system. As long as libraries operate with paper-based files and card catalogs, this model makes quick and well-aimed access to interlibrary loan literature difficult, if not impossible, because the resources of any one library cannot be reliably anticipated, even if a guide to its collections exists, which is rarely the case. The requester must expect long searching operations unless an inclusive and reliable central union catalog exists.[52]

"Pure" models are, naturally, rare and a variety of combinations and in-between structures occurs. For example, the centralized first model rather corresponds to the greater part of the literature supply system that is characteristic for England.[53] There, a central interlibrary loan library with a stock of over 6 million volumes, the British Library's Document Supply Centre (DSC) in Boston Spa (established in 1962 as the National Lending Library for Science and Technology, later part of the British Library as its Lending Division) is paralleled by a separate system of seven regional "bureaux" (essentially union catalogs). Works that are not available from the DSC or its contractual back-up libraries must be obtained from a decentralized reservoir that is partly coordinated and based on a scheme for regional English language subject coverage (Model Three), and partly uncoordinated (Model Four). The DSC dominates as interlibrary loan source and fills roughly ten requests for every one satisfied by members of the regional systems lending among themselves.[54]

The second model does not exist at present in its pure form but does exist in combination with other models. If one views the respective subjects as part of the totality of national literature, the National Library of Medicine and the National Agricultural Library are examples of the second model in the United States, as are in Germany the four central subject libraries. All are responsible for collecting worldwide current literature in their respective disciplines and provide interlibrary loans at great speed within a wide topical scope.[55]

The third model exists in a number of variations and, as mentioned previously, was the pattern for the Farmington Plan in the United States. It is also the pattern in Germany for the humanities, the social sciences, and the pure natural sciences, but—and that point is important in view of the humanities' need for historical literature—it applies there only to the last 40-odd years, that is, to the time since the Deutsche Forschungemeinschaft introduced the Sondersammelgebiets Plan in 1949. For the literature cre-

ated from the beginning of printing to the early twentieth century, the uncoordinated fourth model applies in Germany with the added limitation that the supply is insufficient mainly because of major gaps.

The unplanned decentralization of the fourth model can be found at present in most countries, including Belgium and, for most disciplines, Germany and the United States.[86] The U.S. solution was, first, the creation of the National Union Catalog on cards at the Library of Congress, then publication from 1956 on of the *National Union Catalog* and, between 1968 and 1981, of the 754 volume *National Union Catalog: Pre-1956 Imprints*[87] which contains in one alphabetical sequence the cataloged resources of about 1,100 libraries in the United States and Canada.

While the fourth model used to be an interlibrary loan librarian's nightmare, the development of union catalogs in the form of large databases (often called "utilities") during the last few decades has greatly increased the possibility of finding a desired title quickly among an unorganized group of libraries as long as large numbers of libraries contribute to the database. The largest is OCLC (On-line Computer Library Center) with approximately 17,000 members and more than 30 million records to which over 2 million records are added annually. Other major examples are RLIN, WLN, and UTLAS, and many similar state databases exist online or in microform, such as WISCAT, for all types of libraries in Wisconsin. The techniques to be used, and the responsibilities of the lending and the borrowing library, are formalized in the American Library Association's 1949 *National Interlibrary Loan Code for the United States*.[88]

Interlibrary Loan: Research Facilitator

Interlibrary loan is an essential component of much research. Since interlibrary loan is a process internal to the library world, librarians tend to overestimate its user friendliness. With some notable exceptions, this results sometimes in the implied belief *not* that the system may need to be changed for the benefit of the potential user but that the user adjust to the given system. An extreme example is the demand—admittedly not made by an American librarian although the basic attitude is not unfamiliar— "Users must be so trained that their requirements. . . can be fitted into the library procedures as well as possible."[89] That means "that users themselves must recognize when they need a work and when it must be requested."[90] That kind of "meaningful planning of interlibrary loan requests," along with estimating transaction periods of great, and sometimes extreme, length is sometimes possible and, indeed, practiced. But to make it a principle

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reduces research to an act of intellectual administration. As recently as 1987, Herbert White cautioned: "We have been less successful in improving the rapidity of interlibrary loan than in convincing people that they ought to wait."[31]

It is important to dedogmatize the interlibrary loan system. In many ways the fixation on the interlibrary loan system has led to a grave inversion of perspectives.[32] The professional library world tends to focus less and less on the individual library but to view, instead, the system as a whole. Although initially driven by practical financial considerations, this attitude has begun to represent a change in ideology. In the long see-saw between access versus ownership, access seems to have won. The current ideal image tends to be no longer that the individual research library—regardless of type and size—should be as self-sufficient as possible so that it can fulfill optimally its task of supplying literature. Instead, one hears of policy discussions advocating that even major libraries should concentrate—in all fields including the humanities—on acquisitions likely to be used during the next 10 to 15 years.[33] Today's basic consideration is that it suffices if the total national stock of library resources leaves as few literature needs as possible unsatisfied. That the patron of such a system can obtain the desired works often only with more or less inconvenience, sometimes with great delays, or not at all is considered a virtually unavoidable side effect.

This is not intended to denigrate the achievements of library science or, especially, of individual libraries. Indeed, especially in this country and in recent years, many academic libraries are striving to improve their interlibrary loan performance. For example, the CIC's (academic consortium of the Big Ten universities and the University of Chicago) Virtual Electronic Library project is designed to increase speed and convenience by enabling users to search online catalogs of the consortium's members and to place requests for needed materials directly. The point is merely that, at least to some extent, a heavy interlibrary loan borrowing rate is a likely symptom of insufficient library holdings. It is an expedient, an alarm signal for insufficient library budgets. By making users aware of even more items of possible interest, the proliferation of databases available to users further aggravates any shortages of resources.

For the one-book-reader who wants to obtain occasionally an information source that is not locally available, the ability to obtain the literature from elsewhere is a convenience. The scholar who often needs, for basic research, considerable amounts of literature that cannot be fragmented at

will must face the constant impediment of accidents of interlibrary loan. Even a high proportion of successful transactions does not imply a high degree of usefulness to scholarship.

In a review of interlibrary loans in the United Kingdom and in the United States, Sharon Bonk refers to several disturbing recent reports.[94] For example, although "the increased capacity to locate and quickly transmit requests has decreased the turn around time from the pre-automation days,"[95] OCLC reports "that despite the ever-expanding number of participants and transactions there has been a *decrease* [original emphasis] in fill rate over ten years and *increases* [original emphasis] in average supply times as well as transactions cancelled."[96] According to practitioners in the field, part of the reason for a decreased fill rate is that OCLC does not provide availability or status information about the items requested and, in the case of journal articles, the lack of accurate up-to-date holdings information compounds the problem.[97] Bonk also points out that "many. . . libraries are net-lenders without the benefit of reimbursement. This naturally causes a drain on resources of the lending institution that, when setting priorities, necessarily puts the needs of its borrowers before those to whom they lend. Thus, turnaround times may increase."[98] She concludes: "The real costs of lending and borrowing must be identified 'honestly' and dealt with in determining participation levels in consortia, improving service to the local borrower, in setting local fee-for-service policies, and in reallocating resources within the library budget to purchase efficient document delivery service if the 'free' service is inadequate to needs. In order to operate effective resource sharing agreements, the partners must be sure of reliable efficient document delivery service from others."[99] Since Bonk's study was published in 1980, the number of net lenders who do not charge has greatly decreased,[100] and the ARL–RLG interlibrary loan cost study of 1993 has provided realistic interlibrary loan cost figures. The overall means within a rather wide range are: average cost for borrowing, $18.62; average cost for lending, $10.93; of which 77% of the cost, on the average, is for staff.[101]

Bonk and the ARL–RLG study also mention the use of commercial document delivery services by interlibrary loan (ILL) agencies"[102] and by individual libraries, which seems to be increasing. However, the use of these services without library involvement will not be of much benefit to humanities research since the raw materials for this research are frequently original records which are neither easily accessible to a delivery service, nor are likely to be in the service's own stock. Other methods, to be discussed, seem

more promising. Likewise, the apparently increasing use of commercial mailing services like Federal Express, for which the Association of Research Libraries worked out a special library rate, will be helpful to ILL borrowers of archival records only if libraries are willing to lend such records.[103]

Interlibrary Loan

Technical and Administrative Changes

While ILL philosophy has, essentially, remained stable over the years, recent decades have brought profound changes to ILL procedures.

The first attempts to supply ILL needs by means other than the physical transportation of books began before World War II, when a few—very few—libraries began to microfilm periodical articles. Microfilm was used to some extent in the 1950s and 1960s but has lately lost ground, partly because it requires more staff preparation time, partly because roll film causes problems in use even though the reading machines have been greatly improved, but mostly because reproduction techniques that are easier on the library and on the user were developed. Microfilm has all the disadvantages of the ancient book scroll compared to the codex. This is especially noticeable when entire books are microfilmed, since the film's linearity makes free movement within the text irksome. For modern readers who are used to the paged book, this means a loss of comfort which they are not readily willing to undergo.

During the 1960s, rapidly increasing demands for modern journal literature made it ever more necessary to keep the original locally available and to make only the desired article available to the borrower. The technical development of paper copies in the 1950s and 1960s—available through several technical processes, but primarily through photocopies—made this possible and has, since then, revolutionized the entire information process in scholarship, business, and administration. The copyright law of 1966 encourages this method since it permits duplication of single items for personal use. This system "serves as much the economical use of library resources as the simplification of interlibrary loans"[104] even though the individual user will tend to regard it only as satisfying a personal request. With it, the terms "document supply" or "document delivery" came into use.[105]

Microfilm and especially paper copies are used for many ILL resources, including humanistic research resources, but shipment of the actual monographs still predominates. The advent of the printed *National Union Catalog*

and especially the *National Union Catalog Pre-1956 Imprints* between 1956 and 1981 further aided interlibrary loan processes. It enabled those libraries that could afford these bibliographic tools to contact donor libraries with far more certainty than earlier reliance on guides to libraries had permitted.[106]

Even more profound changes began with the introduction of automation in libraries. In the 1940s, a few libraries began to work with center-punched cards. By the 1980s, almost all libraries owned batteries of computers. In 1979, OCLC introduced its Interlibrary Loan Subsystem which sped up the sending of ILL requests, although it did not improve the speed of document delivery.[107]

To insert a personal note, both authors, one in Germany and one in the United States, have experienced in the past that it routinely requires four to six weeks for delivery which is intolerable if, for example, the requested work is needed to develop the next step in an ongoing project. By way of contrast, the British Library's Document Supply Centre, which handles the vast majority of United Kingdom library requests, aims to supply documents or locations within 36 to 48 hours of receipt of requests.[108] (This comparison may not be entirely fair since the British Postal Service, unburdened by an avalanche of advertising literature sent at cheap rates, is faster than ours, and since the Document Supply Centre was organized for the sole purpose of ILL.)

The recent developments of telefax, digitalization, online catalogs, bibliographic utilities, computer networks, and CD-ROM disks permit a variety of techniques for requesting, sending, and storing recorded information undreamt of in the past. Their final development, and especially their ultimate effect on library operations, cannot yet be fully foreseen.

Telefax or Fax—really telefacsimile—is an optical process by which photoelectric diodes scan a document, line by narrow line, convert these into electric signals which are transmitted by telephone wire or satellite. At the receiving station or stations—for simultaneous transmission to many stations is possible—the signals are reconverted into a copy of the original image, either on photosensitive or regular paper.

Digitalization requires computers or CD-ROM disks at either end of the transmission. It reduces a document, line by narrow line, into streams of binary data that correspond to an almost infinite number of shades of color. At the receiving station, the information can be stored in a computer, on a CD-ROM disk, or reproduced as a copy of the original.

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CD-ROM disks (Compact Disk with Read-only Memory) are a system of audio or video recording or data storage in which digitally encoded information in the form of microscopic pits on a rotating disk with a five inch diameter is accessed by optical readout. With present technology, a single CD-ROM disk can store approximately 250,000 pages of text.

Interlibrary Loan and the End User

ILL activity has been increasing steadily over the past few decades. The reasons commonly accepted are: A decrease in library purchasing power and, in some cases, in library budgets; computer-permitted widespread adoption of online searching; proliferation of databases and bibliographic utilities, often with ILL subsystems, which led to CD-ROM and to electronic messaging systems such as e-mail and telefax, and which increased awareness of more items of possible interest.[109]

In addition, rapid major increases in journal prices caused most libraries to cancel many subscriptions and to rely on ILL for less frequently used, or highly specialized, journals.

Various technologies, techniques, and administrative systems have been, and are being, developed that are designed to simplify and speed up the ILL process. The OCLC ILL subsystem and NLM's (National Library of Medicine's) DOCLINE, for example, permit libraries to locate a desired title and transmit an ILL request automatically.[110] In some libraries, patrons are able to search a database and then transmit their ILL request electronically to their ILL office. Some systems are developing techniques that permit minimal, or even no, involvement of the borrower's ILL office.[111] The extent to which this may cause unjustified requests—for example, when the borrower's institution does have the desired item as part of an uncataloged microform collection—still needs to be investigated. Within the CIC Consortium of eleven major libraries, plans are being developed to alert users of local ownership when attempting to place online ILL requests directly.[112]

Increasingly, the "electronic highway" channels like Internet[113] or ARIEL (developed and pioneered by the Research Libraries Group)[114] are likely to become the medium for patron-generated requests and for transmission of library materials stored in electronic format. They are faster, more reliable, and more versatile than a regular fax machine.[115] A major selling point for ARIEL is the quality of reproduction, vastly superior to that of regular machines.

For patrons, the I.L. picture is brightening. How the new technology and developing administrative changes will impact on research in the humanities, and on libraries themselves, is still to be seen.

Document Delivery and the Humanities

While complaints about slow transaction times are still common, the telefaxing of I.L. request forms has become more common. Also, when speed is required, journal articles are faxed within a few hours of receipt of the request.[116] Most loans are still filled by libraries.[117] Commercial suppliers can fill orders for many types of resources, primarily copies of journal articles. They may or may not be faster than libraries, but they are more predictable in a negative way: If they don't send it within a few days, the item is unavailable from them. But if a library does not send it within a few days, the item may be in use and available at some time in the future. The major U. S. commercial online search services, BRS, DIALOG, and SDC, all have document ordering capability.[118] One of the largest such services is OCLC's Dispatch Service which furnishes copies of articles listed in over thirty abstracting and indexing services and plans to double this database.[119] It delivers copies via fax, overnight mail, and regular mail.[120] OCLC's FastDoc service supplies electronically the full image of serial articles within one hour.[121]

These services augment the traditional interlibrary loan contact between libraries, albeit at a price that drives up the traditional I.L. budget rather steeply,[122] and undoubtedly fill a great demand. But, so far, they are not primarily designed for the researcher in the humanities.

I.L. is not Always the Answer for Resources in the Humanities

The first and most important basis for research in the humanities is to provide the most consistent and inclusive supply of original sources as possible. This consists typically of older material. For such materials, user-convenience cannot be the only determining aspect. Preservation of historical resources is a compelling factor which decisively limits their use.

When considering technical means and administrative structures that could improve the provision of humanistic literature to the researcher, one must consider the nature of the need. In the realms of technology and science, including medicine, typically only recent research literature is required. Journal articles, mostly relatively short, predominate in these fields. The character of the required literature, and the relatively small number of loans needed for any one project, permit here the use of aids which can be used only to a limited extent, if at all, in the humanities.

In the humanities, however, not only modern research literature is needed, but also original sources in printed and unprinted formats. This material is often unique and almost always requires special protection. This is obvious for archival material and manuscripts, all of which must be considered unique. A similar need for protection must be postulated for printed texts whose rarity has long been ignored. This is not merely "run-of-the-mill literature," and even less "ephemeral literature" which, like the research literature of the rapidly progressing sciences, ages so quickly that it could be regarded as worthless from a scholarly and library point of view.

One way of protecting original, rare, and unique resources is to limit public access to them and to prevent ILL. For example, people who are only interested in a manuscript's content must be satisfied with the photographic or digital reproduction. People who wish to study the manuscript as physical object must go to see it. They cannot expect that it will be sent to them.

Another way of protecting rare and unique resources is to make sure that technical aids that are to improve the literature supply in the humanities must not only meet the criteria formulated for the reproduction of the average modern book, but also the added criteria that result from the fragility of the material that is to be reproduced and from its general need for protection. Such equipment, which must satisfy different requirements, including conservationist ones, has been developed in recent years but is very expensive.

From the patron's point of view, the most satisfactory form of reproduction is the paper copy. It can be read without further machinery, it can be written on, and it can be inserted easily into the work flow. But, from the library point of view, paper copy is the most dangerous form of reproduction because, unless one of the new, very expensive, copy machines which copy from above is used, the process almost inevitably damages the binding, especially if the volume is tightly bound. If the paper is brittle, as is true for most 19th century books, additional damage is likely. The individual patron's interest in convenient documentation thus collides with the library's institutional interest in protecting its collection.

As desirable as a special copying machine for books may be, it will only partly solve the problems of providing humanistic literature. While a paper copy produced within conservationist guidelines satisfies the patron's desire for a usable document, as well as the library's desire for careful handling of its resources, it is wasteful and can be defended from an economic point of view only within limits. Even now interlibrary loan of modern research

literature places an extremely high burden on the largest and most efficient libraries.[12] Once it becomes possible to make paper copies of historical resources, the already overloaded copy services will be further burdened.

From the point of view of efficient literature provision, the paper copy's disadvantage is that creating interlibrary loan copies in paper format does not include the possibility of making or storing multiple copies. Every new request requires repetition of the same manual and intellectual procedure. The patron's convenience is thus achieved by a strain on the library which, in the average case, is not in an appropriate ratio to the benefit. The paper copy can, therefore, only be considered as one of several possibilities for reproducing printed texts. In the future, it will certainly not be used more, but rather less extensively.

Microfiche for Interlibrary Loan

Microfiche is one suitable technical aid for supplying literature, including humanistic literature.[13] Initially a German invention made shortly before World War II,[14] it was first used extensively in other countries and has recently begun to be used again in Germany. In American libraries, microfiche was used fairly extensively for COM (Computer Output Microfiche) catalogs during the 1970s and early 1980s and is still being so used to a limited extent, although by now the majority of catalogs are online. The National Technical Information Service issues approximately 60,000 to 70,000 scientific and technical government-sponsored research reports and related items per year on microfiche and keeps them available permanently. They are also available in paper copy, and many also in electronic, others in audiovisual, format. While predominantly dealing with the pure and applied sciences and technology, they do include some social science and even humanities materials. The total collection is approximately 2 million titles and is under good bibliographic control.

Another prolific microfiche publisher is the Educational Research Information Center (ERIC) which issues annually 9,000 to 10,000 research reports per year and indexes annually 18,000 to 20,000 articles from almost 1,000 journals in its field. Its bibliographies also cover about 1,000 books per year which, however, are only available from their publishers.

Microfiche is also used by industry, for example, by some drug store chains, to inform their outlets of the frequently changing insurance and governmental regulations, or by some drug wholesalers to provide price information. Even some colleges are known to send their bulletins in microfiche form to prospective students. Reading machines are, therefore, available in

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virtually every large, and many smaller, libraries, and many users already know how to handle them. The price of microfiche readers has come down, and good readers are now available even for personal use at a price of about $250. It, therefore, seems reasonable to use microfiche also for other purposes, particularly when the amount of information (such as a monograph) is more appropriate for a microfiche than for a digital CD-ROM disk.

On the one hand, literature in the form of microfiche reproductions has some disadvantages for the users. Like microfilm, they need a reading machine and thereby lack the comfort, clarity, and emotional familiarity of the printed page or its full-size paper copy. On the other hand, sheet film is simpler to use than roll film since it is the size of an index card and thereby similar qualities as a sheet. Reading machines which permit simultaneous use of two microfiche exist, permitting even simultaneous use of an index with its text. Another user advantage is the possibility to store considerable masses of text in the form of card indexes. Under some circumstances, the entire series of texts that are needed for a scholarly product can be combined and easily transported.

One disadvantage of film—the necessity of using a machine and reading from a screen—is now compensated by the possibility of recopying the screen image in macro-form by merely pressing a button, albeit at considerable cost. Copiers for $4,000 to $6,000 are available, but the best current machines, by Minolta, cost $12,000 to $16,000. They copy both film and fiche to paper through a Xerographic process with a stable toner. Earlier models used a photographic process with chemicals that tended to deteriorate and sometimes even affected the machine if it was not used frequently.

With respect to production, many microphotography machines still tend to be hard on the original, like most full-size copying machines, and cannot be used for fragile monographs. A notable exception, which is also a boon for tightly bound volumes, is the Minolta DPC S 3000 Digital Publication Copying System, which permits face-up copying, two pages at a time, with curve correction and shadow-erase. It is being expanded to handle also microfilm and CD-ROMs, faxing, and e-mail.

Microfiche is now the preferred medium for ILL of journal articles and book chapters. It has advantages of which no other reprography method can boast at present. Microfiche production is less time consuming than paper copy production; it is considerably cheaper to produce than paper copies or CD-ROM; and microfiche copies can be mailed more cheaply than a book or macro-paper copies.[16]

The use of microfiche for making the literature of the humanities available is one means of solving urgent conservation problems. If the libraries are suitably equipped, the entire pre-1900 literature need no longer be mailed in book form on interlibrary loan. Once filmed, a book or document could be archived. Use of the original would be necessary only when it is not a matter of the work's informational content but of the book as a physical object, as for analytical bibliographic research, printing history, or similar projects. In such cases, use would typically occur at the place of storage.

Major Micro-Collections

Of major assistance in enriching library collections, protecting original resources, and making them available to any library without the use of interlibrary loan are basic major micro-collections of primary resources. While the price for a collection may seem very large, the price per title within a collection is typically very small, especially if savings in staff time are considered.

Examples of such collections of copies of original documents are *Early American Imprints 1704-1820; Three Centuries of English and American Plays, 1500-1800; From to Khrushchev, the USSR in Retrospect, 1917-1956, The British Sessional Papers, House of Commons* all issued by Readex Microprint Corporation New Canaan, Connecticut. Originally issued in microprint form, most are now available as microfiche or microfilm. From among the hundreds of other sets, two examples must suffice: (1) The *Goldsmiths'-Kress Library of Economic Literature*, issued by Research Publications of Woodbridge, Connecticut, contains microfilmed resources on that topic from pre-1800 to 1850 in the London Library and Harvard University. (2) The *Nineteenth Century Collection*, issued by Chadwyck-Healey in Cambridge, England, since the mid-1980s, is an ongoing, enormous, 30-year project of microfiched primary printed sources in English in Great Britain. Its general series covers social sciences. It has also several special series which cover publishing, the book trade, literature (including women writers), and the visual arts and architecture.

Like all library acquisitions programs, the composition of such collections is often a matter of judgment. While the *British Sessional Papers* are collected in their entirety, only "important" plays were collected for the *Plays* collection, and judgment comes even more into play for subject-oriented collections like the *USSR* collection. If conscientiously and carefully compiled by neutral subject experts, such micro-collections increase the research capability of individual academic libraries greatly without straining their interlibrary loan load.

In many major U. S. libraries the number of monograph titles available in microform is by now at least equal to the number of titles available in print form. They tend to be less used than the print collection, partly because by their very nature they consist of less-than-popular materials, and partly because, until recently, most were not integrated bibliographically in the catalog, especially the card catalog, which accesses the library's print collection. Because of the expense involved, many libraries do not catalog, or give only limited access cataloging to, individual works that happen to be in microform. While some micro-collections are accessible through their own bibliographic access tools (of which many early ones were not very helpful) micro-publishers have been, until recently, lax in analyzing, and thus providing bibliographic access to, their collections. A good example of a recent well-indexed collection is Chadwyck-Healey's previously mentioned *Nineteenth Century Collection* which is accessible on MARC tape with subject access. But, typically, the use of micro-items requires special bibliographical knowledge and skills on the part of user and staff.

A very encouraging development since the middle 1980s has been the "Major Microforms Sets" project initiated by the Association of Research Libraries. This is a coordinated effort in which libraries throughout North America which have indexed or analyzed one or the other of such sets in nonprint media, or which are in the process of doing so now, make these analyses available at a price to the library community, either on tape or through direct electronic transfer to OCLC.

One problem, restricted to micro-opaque format (as against microfilm or microfiche) is of a technical nature: The Microprint Corporation stopped in the early 1970s to produce Microprint and has re-issued its Microprint collections in microfiche form. The special Microprint reading machines are also no longer being manufactured. The existing machines are aged and cannot be replaced. When they become unusable in a few years, so does a library's existing Microprint collection, often representing tens of thousands of dollars, unless digital scanners can, in some way, be adapted to the opaque medium.

The extent to which the rapid development of digital technology will change the microform scenario is difficult to judge, but many major micro collections are likely to be replaced by CD-ROM versions.

Electronic Document Storage and Delivery

Digitalization and the CD-ROM disk are other means of copying and supplying literature. Three factors make digitalization technology interesting

for literature provision. For one, its "neutral" character. The scanner "sees" the original merely as a picture, regardless of whether it consists of text or illustrations or combination text-with-illustrations. Any original can be converted without difficulty.

The second reason is the many ways in which the digitalized "image" can be used. Under the generic term "electronic document delivery" several possibilities of long distance transmission have been in use for some time. The image can be forwarded at once, for example by a FAX transmission or, more likely, via a data network over short or long distances directly to the individual requester's computer. But it can also be printed as a paper copy or stored on a CD-ROM disk. By now a common storage format, the CD-ROM disk is often used to store considerable amounts of bibliographic or other information. It can be mailed easily and is as suitable as the microfiche for updating information by means of replacement CD-ROM disks.

The third reason that makes digitalization so interesting for literature provision is its indexing capabilities. With a proper program, digitalized text can be accessed virtually word by word.

Many bibliographic and reference tools exist on CD-ROM. Some government-issued information, especially of a statistical nature, is now *only* available in digital form, including on CD-ROM. Many text collections prepared by commercial firms or professional organizations now exist in CD-ROM form. These are often of a fairly specific nature. One example is *Callaghan's Official Wisconsin Reports on LawDesk*, an over 200 volumes collection of Wisconsin Supreme Court and Court of Appeals decisions available on one disk.

Some of these text collections on CD-ROM are of interest to teachers and researchers in the humanities. One example is *Perseus*, a huge ongoing interactive collection of: (1) primary texts by all known Greek writers, available in Greek, Latin, and English; and (2) textual descriptions and original color photographs of all known Greek historical objects, ruins, and sites, down to the time of Alexander. The color pictures are available on the CD-ROM disk and, enlarged for projection purposes, also on a videodisc. The lexicon permits "as if" questions. The project is designed and executed at Harvard University and sold by Yale University Press.

Another example is Chadwick-Healey's "*Patrologia Latina Database*," a collection of the texts of the Latin Fathers of the Church from 200 to 1216 A.D., a copy of the 221-volume nineteenth-century publication of the same name.

As with any pre-assembled collection, one must be aware of limitations such as time limits. For example, one collection of interest to humanists is the *English Poetry Full-Text Database*, a full-text collection of virtually every work of poetry (major as well as minor) published in Great Britain before 1900. It contains over 165,000 poems drawn from 1,500 printed sources. To prevent copyright problems, no later works or later editions of earlier works were included. Recent editions or possible corrections must be obtained elsewhere.

While the number of CD-ROM text collections of interest to humanists is growing fairly quickly, problems in the areas of financing, copyright, and royalties must still be resolved before such collections can multiply. Among the organizations of note in this field are the University of Virginia—a pioneer in electronic texts—and the Center for Electronic Texts in the Humanities, established by Rutgers and Princeton universities in 1991 with the mission to advance scholarship in the humanities through the use of high quality electronic texts. Among other activities, it catalogs existing electronic texts within the Rutgers *Inventory of Machine-Readable Texts in the Humanities* which is held on RLIN. At the University of Toronto, the Centre for Computing in the Humanities (CCH) supports the university's departments in the humanities and social sciences and publishes a monograph series, *CCH Working Papers*, for computer-assisted research in textual studies, and *CCH Electronic Texts*, computer-readable editions with research applications.

Digitalization technology has already influenced library operations considerably, particularly in the areas of bibliographic control and reference. Its full effects on the library and information world cannot yet be foretold with certainty but are likely to be profound and beneficial.

In storing large amounts of texts, the optical storage disc is opening up new approaches which are also beginning to lead to their use in supplying humanities literature, which is often tied to an extensive body of texts. At present, a single CD-ROM disc slightly less than 5 inches in diameter can hold about 540 megabytes of information, roughly equivalent to 250,000 pages of text.[12] Technology that greatly increases the capacity exists and will come into use soon. Hard disks with even greater capacity are being developed. An ultramicrofiche, on the other hand, can store "only" 3,000 pages[13] and suffers from the lack of readers or copiers which can magnify sufficiently.

When compared to storing primary sources in text form, optical disc stor-

age has advantages which are especially telling in making humanities literature available. Optical storage is in facsimile form and thereby preserves the incidental physical aspects of a text which are lost when stored in a "text file"—i.e., a file that reads only letters and numbers. Readers of an optically stored text page see the exact "image" of this page. Furthermore, unlike text typed into a computer, the text stored on an optical disk cannot be manipulated. It can only be reproduced in toto in the stored form.

Nevertheless, because of the economics involved, it is unlikely that digital storage will completely supplant microstorage as a means of storage and of interlibrary loan. Rather, it is likely that individual monographic titles and relatively short items of any kind will continue to be stored and lent via microfilm or microfiche or paper copy, while large items such as cumulated bibliographies and collections of original resources will be stored, transmitted, and lent via digital means.

MEETING THE ASSAULT ON NATIONAL LITERARY RESOURCES

Accessing and Preserving Historical Resources

Beginning in the late 1950s, the so-called Sputnik-shock led to greatly increased support of the sciences. The gloomy prognoses on education, which resulted in visions of a national catastrophe, had a similarly stimulating effect on support of the humanities. The 1960s and early 1970s were an era of explosive growth. Political authorities readily met the demands of education and scholarship in the hope that increased funding and an increased number of educational and research institutions would automatically assure the head start that seemed to be needed.

With the growth of scholarly institutions, the need increased for personnel whose rights and responsibilities include research. The considerable increase in job slots increased the need for qualified applicants, so that the job placements, whose basis is a piece of research, necessarily multiplied. The growth in personnel conducting research led to competitive situations in which the more original theme, the more interesting methodology, or the more thorough research process were the selling point. Accordingly, the choice of research object often tended to be decided less on the basis of its intrinsic value than on its suitability for professional advancement.[12]

The inevitable result of this development is an increase by leaps and bounds in the demand for research materials, including materials for research in the humanities. Not only did the customary specialization lead to hitherto

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ignored spheres, but there is also an increased tendency to use large bodies of resources in order to attempt an overview of broad time periods or broad topical areas. The speed of the expansion also caused totally unanticipated needs to be articulated.

As novel as to the extent research materials were used was the way in which they were used as a matter of course. In the progression of the political changes of the 1960s and early 1970s, a hitherto unknown right of information was proclaimed in many places that forced unlimited access even to resources whose general accessibility no one had imagined as late as the 1950s.[39] This was true not only for resources whose content had formerly limited access, but especially for materials which had not been made generally available because of their physical condition.

Within the last forty years, a gigantic "research wave" has swept over almost all important libraries, a wave which, in view of its consequences, more than a few library administrators considered a flood. The immediately visible effect was a degree of wear and tear of the resources such as had never before occurred in so short a time. Individual use increased, and at the same time research trends and research modes were shaped that led to constant use of certain types of resources, and especially older resources. The approximately simultaneous introduction of modern copying technologies added to the load and resulted in damage to large numbers of bindings and book pages.

Less obvious, but no less important, was a growing degree of uncertainly in the administration of library resources, an uncertainty that resulted from sudden mass use. Librarians became increasingly "reader-oriented" and saw as their goal the greatest possible access to resources for a kind of use that often enough regarded the protection of books with indifference.

Viewed from a long-range perspective, there are two results. For one, the unexpected wide-ranging use of historical and modern resources signifies the beginning of a new era of library use. In the future, libraries must expect not only use of their resources by masses of people, but also intensive, sometimes even reckless, exploitation of their collections. In the future, they will be able to count even less than in the past on their readers' interest in preserving their resources. At the same time, it has become obvious that the legitimate access of researchers to their sources is even greater than libraries had assumed heretofore. In this way, the relationship between users and libraries has changed, and it will be impossible to return to the conditions common prior to the expansion of the research business.

On the other hand, the assault on the resources and the sometimes careless use have created a new sense of responsibility among librarians which goes way beyond the immediate cause. The thought is sprouting that book collections are a section of cultural tradition that is as worthy of being preserved and protected as any other historical monument. In many research libraries, valuable resources, heretofore housed in the general stacks, have been transferred to "special collections" during the past two or three decades.

With respect to protecting their holdings, libraries are in a more difficult position than museums. Museum patrons look at exhibits but typically do not touch them; library patrons handle and use library resources with few restrictions. For print material and for miniaturized resources, the wear and tear can be heavy, especially if the user is careless. Museum patrons are exposed to what is visible but typically do not exert pressure on the administration to show the usually far greater part of the museum holdings that are in storage; thanks to electronics, library patrons have bibliographic access to library resources of whose existence they had been unaware in their own and other libraries and can demand their use. It will be the task of the future to find a new balance between the demand for availability and the demand for preserving historical book resources. The libraries themselves have proclaimed as their simultaneous goals the accessibility and the preservation of their resources. A 1975 conference in the Bibliotheca Vaticana, with the theme "Conservation et Réproduction des Manuscrits et Imprimés Anciens," has given direction to these efforts.[11] In the United States, the Association of Research Libraries (ARL) is in the forefront of organizations that have been working for the last few decades with both goals in mind.

The tendency toward compact storage of older and less-used resources, often in buildings remote from the parent library, will most likely increase. It, in turn, will cause an increase in use of remote resources. This type of use will increase even more because large union-catalog-like databanks like OCLC, WLA, RLIN, or UTLAS provide easy access to distant collections of other institutions. On the other hand, in contrast to the last statement, major portions, especially of large and well supplied libraries, are still not under integrated bibliographic control, as previously mentioned.

The increasing number of large, and mostly non-judgmentally compiled collections of original texts in micro- and especially digital-form, especially in the humanities and social sciences disciplines, not only enriches local collections but is also apt to decrease ILL demands for the originals. The extent to which libraries will actually buy such expensive collections, per-

haps at $10 per original volume for digital versions of 10,000 to 50,000 volumes, remains to be seen. Perhaps these collections will lead to increased long-distance copying of selected items rather than purchase of the entire digital copy, but how digital resources might be shared on an ILL-like basis is not yet clear. Copyright reforms in the United States threaten to make it illegal or expensive.

In any case, these collections are only a partial answer to the ILL and preservation problems. The preservation of older resources is being increasingly recognized as a complex problem that needs solutions. The wear and tear of library holdings, which has increased during the last few decades, has directed librarians' attention to the fact that protection of books from decay is not merely a matter of handling the individual object but is a separate profession which includes paper chemistry as well as user training.[132]

For a long while, conservation was identical with restoration. Recently, and primarily under English and French influence,[133] the term "conservation" has been used as a generic term to include preventive measures which are to protect resources from the beginning. In the case of most books published from about the 1830s to about the 1960s, which are self-destructing because of paper acidity, only damage control can be done at this stage of technology by means of chemical treatment and/or micro-copying of originals. Unsuitable storage conditions and careless use are the other main causes of damage. Typical measures taken to provide effective protection for appropriate works from the very beginning are a range of suitable preservation measures and appropriately limited access. Storage is a purely internal library matter, but limiting access affects the patron very much. Here, coordination is necessary between the librarian as delegated guardian of a collection and the scholar as interested party.

Preserving Regional Resources: A Suggestion

"Library collection development and maintenance is a fundamental part of research."[134] Ideally, research in the humanities is based on inclusive comprehensive library resources with good bibliographic access. A major component of such resources is a library, or a coordinated group of libraries, that preserve the home nation's early, current, and future literature—using the term "literature" in its widest meaning—not only for the standard purpose of use but for archival purposes—i.e., libraries that, together, fulfill an archival role.

In some countries, the archival role is a legal responsibility of the national library, in others a more or less coordinated group of libraries accepts a

limited part of this responsibility. In the latter case, the problem is that these libraries usually act on the basis of interest rather than of law and are under no obligation to maintain this interest. In other words, continuity and coordination are not guaranteed.

If the mission is self-assigned and uncoordinated with other libraries, it is apt to change in time and thereby cause gaps in the preservation of the nation's records. An example is the Library of the State Historical Society of Wisconsin, next to the Library of Congress, probably the best collection on North American history. For decades, the staff of its Documents Division actively collected, as part of its self-assigned mission, as completely as possible, free and priced documents of the states of the United States. However, beginning in the late 1930s, the great increase in state publications, staff reductions, and budget constraints gradually caused the society to seek state documents less and less aggressively, until now it collects only representative samples from several states, along with some "hand-me-downs" from the Wisconsin Legislative Reference Library. It does subscribe to the *Statistical Reference Index*[135] with its microfiche collection of state documents of a statistical nature, but it can no longer claim to have a complete archival collection of the documents of the states of the United States in this one location.

The North American Collections Inventory Project (NCIP), a collaborative effort of the ARL and the Research Libraries Group (RLG), does not aim to create a series of archival libraries. But the project, and especially its *Online Conspectus Database*, is designed to provide complete standardized information on the location of specific subject collections and their relative strengths in North American libraries with research collections.[136] It should ultimately become a useful guide to holdings strengths and help in coordinated acquisitions policies. Unfortunately, the project does not seem to give sufficient emphasis to regional aspects.

Selection policy is typically based on perceived needs. Public libraries tend to select more on the basis of estimated current frequency of use, research libraries on the basis of estimated possible present and future topical interest. Either guideline leads necessarily to selectiveness among and within subjects and disciplines. They are understandable and justified since most library holdings are reproductions and likely to be available in more than one library. They are justified since all libraries serve different clienteles and since no library can be all-inclusive.

Libraries as a group do, however, have the responsibility to preserve the national literary output. In a large country like the United States, this can be done most efficiently on a regional basis.

The region's responsibility in the historical archiving of regional literature differs from other collection activities which are necessarily selective or which aim at the preservation of certain traditions as represented, for example, by religious or labor union libraries, or by teaching curricula. Any selectiveness on the basis of criteria of "relevance" based on current political or intellectual movements or educational policies leads to limitations which impair the archive's usefulness. This includes the criterion of "permanent value."

This means that even those segments of the regional literature that, according to present opinion, are considered as undesirable and not worthy of preservation, should be preserved. Regional literary output cannot be appropriately archived on the basis of current political or social parameters. Such an archive is not a vehicle for making available for potential use what seems to be of future significance, but what actually was published in the past.

It includes writings which may now be considered trivial or ephemeral; it includes any writing which reflects the cultural, social, and political climate characteristic of its region and age. It includes records which may or may not be kept by other agencies, including local and regional government agencies since these are not known for preservation and organization of their own older records. It includes records like agenda and minutes of city and council governments, local newspapers and periodicals, and "underground" publications. It includes especially literary products of local and regional writers who may or may not be known outside the region. Furthermore, since especially in academic institutions some resources (such as slide collections or print collections) are sometimes controlled by units other than the library, they should be included in any regional collection and preservation plan if of regional significance.

A century and a half ago, John Langdon Sibley (assistant librarian of Harvard College [1842-1856] and librarian [1856-1877]) was known for collecting everything he could lay hands on. "Every piece of print had a value to him. 'Sometime it may be of use to somebody.'"[13] He may have shown excessive zeal, but his basic idea was sound.

Ideally, a regional literary archive—this single library or coordinated group of libraries—will house all of the region's writings in all their breadth and differentiation and in any format. It should permit answering virtually every question that can be asked about the region's past. If, as has been suggested, research in the humanities is always work in and on a tradition, then

the regional archive of printed and other texts is not primarily a museum-like collection of historical documents but the largest possible supply of sources which enables the ever-lasting effort of writing the regional history. This concept goes beyond political history to the history of the total intellectual and spiritual life, so that the history of the region's literature and music belong to it as much as the history of economics and scholarship.

The most important problem in developing a regional literary archive or coordinated group of archives is likely to be a mental one, the conviction that it is a regional duty to preserve the region's printed tradition in a manner appropriate to the material and to research. In this way, a "seamless" record can be created of the country's intellectual product.

BOOK AND JOURNAL AS MEDIA FOR THE HUMANITIES

Modern sociology of knowledge has shown that scholarship is "public knowledge." Scholarship consists of insights which have been obtained through controlled methodology and about which a rational consensus has been achieved through a formal method of presentation. Mere publication does not turn insight into a scholarly insight, but without publication no insight can become a scholarly insight. Publication is, therefore, no incidental feature but an integral part of the scholarly process. Without publication there can be no scholarship. The act of publication is the enabling factor.[18]

In the broad sense of "making public," scholarly publication can occur orally. Traditionally, this is in the form of lectures such as have existed since the early days of modern scholarly enterprises. Although, over the centuries, the framework within which lectures were given has changed from relatively small scale meetings of learned men to congresses of scholars, the lecture has remained largely constant as a means of communication. It is characterized less by the apparent informal act of communication than by its limited audience.

Paper-Based Book and Journal

If scholarly publication is to reach a wider circle and is also to become permanent, it occurs in written or otherwise recorded format. The conventions of written communication are more flexible and were shaped in the course of lengthy development. The results of these developments have been stabilized and have consisted for centuries of the scholarly book and the scholarly journal. More recently, in the United States the separately published government-sponsored "research report" was developed, and

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still more recently, and still very rarely, the electronic journal. Neither plays so far a significant role in humanistic research.

The modern scholarly book developed from the learned treatise in a series of intermediate steps into the form of the monograph that is accepted today as the standard form. Journals are of more recent origin and owe their development to special constellations of the second half of the seventeenth century.[15] Although some basic characteristics existed from the beginning, the journal found its current format only in the course of time.

The late nineteenth century witnessed a consolidating phase for shaping the scholarly literature formats. These formats are the result of the then occurring institutionalization of research. This does not mean that no changes have occurred since then. Book and journal must adjust continually to new requirements, and this process has so far not ceased. But by the end of the nineteenth century, both scholarly literature formats had been standardized to the extent that no further basic problems presented themselves.

Monograph and journal article are different forms of communication and do not play the same role in the various branches of scholarship. While the act of publication characterizes both of them, the format in which these can or must be done is not necessarily the same. The research task and the methodology used to report on this research exhibit different characteristics in the various disciplines; they can vary even within the same discipline.

The sciences and journals traditionally have had a close relationship. Already in the early days of scientific investigations, the need was felt to document the process of discovery continuously and was a major impulse for the "creation" of the journal. The very first scholarly journal, the *Philosophical Transactions*,[16] fulfilled essentially the functions of a continuous protocol. It recorded the results of scholarly efforts in condensed form and made them part of a fund of communicable findings. The journal thereby acknowledged the sequential nature of research, and in this way reflected its original task of being a "sequentialized book."

Fundamentally, the sciences aim to discover generally applicable rules, laws, and order. Ideally, the principle of necessity should be found to explain natural phenomena. The idea of a "formula" is characteristic for an understanding of the sciences. Its task is the condensation of the scholar's findings into a metalingual precise expression that avoids the ambiguity of the common language. In this way, gaining insight in the sciences is, in

itself, a process of condensation, of reduction: it aims at the greatest possible degree of generalization. A particular phenomenon can be described economically, and the general nature of the desired finding usually permits a condensed report. The scholarly journal article is a natural corollary to this type of presentation.

The humanities, however, as a rule, aim at a different kind of insight. According to the well-known terminology of Wilhelm Windelband, they are "ideographic," that is, their intent is to discern the exceptional in contrast to the common.[11] In principle, the individual historical phenomenon is the specific research object of the humanities, and they regard it as their task to describe this individuality in its relevant context. However, this does not prevent their attempt to gain generally valid insights.

In the humanities, facts are typically presented not in order to subsume an individual case or phenomenon under a general law but in order to characterize the features that distinguish that particular phenomenon from others. Insight in the humanities, therefore, differs from insight in the sciences. For this reason their need for communication also differs.

Deposition in the humanities tends to be discursive and primarily of an argumentative and interpretative nature. If it records historical developments, it can also be primarily narrative. Therefore, the typical research report in the humanities cannot be condensed, in contrast to the typical research report in the sciences. The analysis of a work of fine art or of literature aims to describe its differentiating details, even if in the context of the art form's general characteristics. Its task is to carve out that which cannot be condensed or generalized, just as a biography must record and trace a singular sequence. Bluntly put, the core of a research study in the humanities can be reduced only to the extent that it is attempted to compromise its discursive structure.[12]

Since "progress" in the humanities occurs more by way of a change in methodology and point of view than in the discovery of "new" facts, research literature in the humanities tends to age, if at all, more slowly than in the sciences.

Deposition in the humanities tends to develop concepts and arguments in linear form. "Linear text works exceptionally well for building understanding and enlightenment and for story telling."[13] Linear text which develops arguments and which interprets, requires sustained reading and, in the words of Crawford and Gorman: "Books [in print-on-paper format] work better than any alternative for *sustained* [original emphasis] reading. While computer devices are better for communicating data and small packets of

information, even most technologically knowledgeable people. . . confirm the obvious: For linear text of more than a few paragraphs, print-on-paper is the preferred medium."[11]

For all of these reasons, the book is the literary format most suitable for recording cognition in the humanities and, because of the humanities' specific communication requirements, a primary relationship exists between the humanities and the book. This relationship did not develop traditionally, as might be assumed, but is an inherent one, just like the affinity of the sciences to the journal.

Although the bond with different literature formats, of the sciences on the one hand and the humanities on the other, is characteristic, it should not be considered as exclusive. Books exist in the natural sciences, just as there are journal articles in the humanities, and in both disciplines the tradition of using book and journal goes far back. The sciences and the humanities need both, but not to satisfy identical communication needs. For either discipline, the "atypical" format fulfills another function, if viewed from the aspect of the method of discovery and the structure of the report.

In the sciences, the book is needed to the extent that the studied subject eludes condensation. This can be seen clearly in situations that deal with the descriptive or theoretical disciplines of the natural sciences. Since the detail, the specific situation, is not subsumable, a wider palette is needed for the presentation, and the book is here the suitable medium for recording an inherent complexity.

In the humanities, the journal article is not used because some scholarly investigations deal with matters that must be recorded in a non-discursive manner, in addition to those that must be reported discursively. Rather, the journal article is used to the extent that the research topic, in spite of the necessity of reporting it in a discursive manner, decreases in volume. Not the topic but its specific "diminutiveness" demands the use of the journal article. An additional reason is the constant pressure to publish which encourages researchers to split topics worthy of a monograph into several smaller units that can be published in journals.

Among the growing number of journals in the eighteenth century, the journal's breakthrough into the humanities as communication medium of scholarly as well as popular writing is a result of the specialization that began in the nineteenth century, with the resulting concentration on small and diminutive research topics. The dissection of the fields of scholarship into increasingly limited spheres created the prerequisites for the use of

the journal article as a means of communication. Simultaneously, it created a demand for ever more journals as organs of communication and as vehicles of expression for the developing groups of specialists.

In this process, the journal "overtook" the book and by the middle of the century it was evident that the journal article had become the "real" medium of scholarly communication. In his "Speech on Leibnitz Memorial Day 1874," Theodor Mommsen commented that "in all branches of literature, the scholarly article, and especially the scholarly journal, had taken by now first place." In this he saw an ambivalent "one-sidedness of contemporary research," and he regarded the whole scholarly situation as a result of an irretrievable specialization. In today's research enterprise, the journal dominates and, according to a frequently expressed opinion, the journal article is the medium which modern scholarship uses to articulate. There is undoubtedly some truth in this. During the last three or four decades, an extraordinary increase in journal literature has taken place in all fields of scholarship. For example, the number of journals in the humanities increased by more than 100 percent between 1960 and 1975.[15] It is well known by now that an ever increasing portion of library resources funds must be spent for journals, and that the journal pushes the monograph into the background.

The preponderance of journals in the sciences can be explained easily since in this discipline real "continuity" or "development" of research takes place. In general, a problem that has been solved stays solved. In this field, the journal records the progress of research as it occurs, and the significance of the journal article ceases once the problem that is being investigated has been solved. The well-known relatively short "half-life" of journals in the sciences shows this clearly.

The humanities have no comparable "continuity" or "development." The task of unlocking and conveying a cultural tradition is, by its very nature, not marked by a continuity comparable to that of research in the sciences.[16] Realistic acute research questions exist, of course, but in general there are no permanent solutions. In the humanities, actuality and continuity are different categories. The journal is, therefore, a medium for reporting research results in the humanities but is not, unlike in the sciences, an indispensable means of communication.

In the humanities, the printed journal is needed as a repository for reporting the results of research on special problems or problems of minor scope. However, in the total process of scholarship, it functions primarily as a collecting organ in a more readable and more permanent format than digitalized information. This is shown clearly, for instance, by the occasional but

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typically awkward use of the printed journal in the humanities (and also in the social sciences), for example, in single issues that collect articles on a specific topic. Actually, these are collections in monograph form. Other examples are scholarly writings that are published as print-on-paper journal articles but are, in their make-up and length, monographs.

These points are stressed here because the printed journal's omnipresence in today's scholarly publication set-up not only clouds the different communication needs of the sciences and the humanities but may, in the long run, even push them into the background. Because of modern scholarship's general affinity to the printed journal which permits an easy, quick and, within certain limits, temporary means of communication, the existing imbalance between monograph and journal will shift even more in favor of the printed journal. In an age characterized by narrow or specialized research, the humanities definitely require among their various communication formats one that permits publication in small doses. Whether this format will be able to keep its identity as the nature of scholarly work requires is still an open question.

The Electronic Journal and the Humanities

A recent development is the emergence and explosive growth in the 1990s of the electronic journal[5] along with its digital relatives—i.e., magazines, bulletin boards, discussion groups, conferences, and similar more or less formally arranged and more or less regular electronic media. No exact figures are available, but at the time of this writing a reasonable "guesstimate" is that approximately 1,000 of these "publications" deal with the humanities in one form or another.[6] They are uneven in quality, and content varies from scholarly writings and reviews to humanistic content itself and to personal effusions. While many lack the filter of editorial supervision, those which deal with highly specialized topics are a means of letting specialists reach a tiny audience of professional colleagues. Many of these "one person" products are unstable and unpredictable. But at least 250 to 300 are likely to be stable, including some electronic editions of products of major print publishers such as Johns Hopkins University Press.

To mention only a few of the library problems that seem inherent in electronic journals in any field at this developmental stage—i.e., keeping track of them, since they tend to appear, change, and disappear (libraries and bibliographic utilities are beginning to address this problem); developing a standard that permits precise page citation which is essential for research purposes and difficult to achieve when the author can change an electronic

product at will: deciding on the proportion of the acquisitions budget to assign to priced electronic products; and the various ways in which libraries must handle them. Contrary to popular assumptions, electronic journals do require staff intervention. For example, especially because of the journals' ephemeral nature, the library must decide whether to download them, keep them on the mainframe, or print them, with all the resulting bindery problems. Libraries have here, too, an archival responsibility and must weed the considerable amounts of ephemeral from the more permanent content. Electronic journals must be cataloged, and they should be made available for ILL—which raises copyright problems. Although ILL for electronic journals sounds like an oxymoron, it is already taking place.

For the researcher in the humanities, electronic "publications" present other problems. Some experiments with electronic journals have the goal to make printed journals superfluous and to store scholarly articles in digitalized format suitable for copying on demand. According to current opinion, such storage must be done "in a suitable form." What that means has, so far, not been specified. However, initial considerations lead to the conclusion that screen-based literature requires rigorous structuring of the text since skimming is impossible.[17] This can be done fairly easily for writings in the natural sciences. However, writings which contain an argument or a discussion present considerable, but from the aspect of media technology not insurmountable, difficulties. Writings in the natural sciences will undoubtedly become the prototype of the "electronic treatise," and they will help to shape the new publication conventions. Abstracts will be an important, perhaps the most pronounced, characteristic. In any case, the positive effects which the requirement for structuring will impose on even the "argumentative" essay are likely to be balanced by considerable negative effects:

> There are . . . dangers in the tight structuring of articles. Writers might gradually drift into producing papers that were all structure and no style, and lose the facility of continuous writing. If this sounds unlikely, anyone who writes will be aware how long and possibly laborious a process it was to learn to write coherently, continuously, readably and with some sense of style.[18]

The revolutionary changes which are occurring in the world of publication cause book and journal to lose the obviousness with which they have formed part of the scholarly communication network up to now. The possibilities at which electronic data storage hints indicate that book and journal are not the only possible, the natural, media of communication as might be assumed on the basis of a century-old tradition. Rather, they are specific information media whose characteristics were shaped in the context of a typographical culture.

Their gradual move into the background not only illuminates their relationship but also their individual characteristics. Especially with respect to the book in print-on-paper format, it becomes obvious that it is more than merely a basic unit in the process of communication. In the course of its long history, it has achieved an authoritative status that reaches far beyond the typographical sphere. It is an organizing and regulating factor in obtaining, as well as communicating, insight. "In the humanities, the book is much more than a slab of information. Certainly it may be made up of an accumulation of words—and facts—but the whole is greater than the sum of the individual parts, the means of evoking imaginative, creative responses."[15]

As one of the symbolic forms of written culture, the book cannot merely be considered as a means of communication that happens to be suitable for the humanities. In the context of past and present developments, it must be postulated as the ideal standard for publication in the humanities.

EPILOGUE

Librarians and researchers tend to view research resources from different vantage points. With relatively few exceptions, researchers tend to be interested in their own needs. This is understandable since they do not bear responsibility for anyone else's research needs. Only when the unmet needs of a number of their peers converge do researchers tend to become advocates of basic reform. Librarians, on the other hand, must take a more general view since they are responsible for meeting the supply needs of all their patrons. Even in research-oriented libraries, these patrons include many nonresearchers or researchers while they pursue their other professional activities. And, unless the library specializes in a particular subject or discipline, the needs of patrons in many subjects and disciplines must be met.

Especially while on the trail of a project, the researcher in a humanities field wants at hand, ideally, immediate direct access to all original resources needed for the current project along with all pertinent secondary literature and all pertinent reference works. Since research, including research in the humanities, is often international, the national origin of research results is insignificant. The research collection should, therefore, be based on relevance rather than language although, particularly among Anglo-American researchers', language barriers sometimes result in assumed self-sufficiency. Furthermore, since some research in the humanities tends to be cross-cultural or interdisciplinary, the researcher may need to cast a wide net and wants, again ideally, the same types of resources in whatever other subjects or disciplines the project leads to.

Selection decisions regarding basic, as opposed to special, research needs are, therefore, not plain or self-evident. From the librarian's point of view, these requirements tend to look like unrealistic and insatiable demands. The librarian of a general library, research or otherwise, is obligated to furnish a balanced collection appropriate to the needs of the respective clientele; balanced in terms of the range of subjects and in terms of point of view. While balance in terms of range of subjects is typically rather well achieved, balance in terms of point of view is more problematical. For various reasons—among them lack of suitable material, perceived lack of interest by patrons, budgetary limitations, self-censorship, sometimes even the librarian's personal preference—the less accepted heretical point of view is often underrepresented in collections. Especially in a research-oriented library, furnishing resources that represent all types of view is important.

Along with the resources the researcher, especially in the humanities, requires, again ideally, is sufficient work space in the library itself or preferably in his or her office. The working space should be secluded enough to prevent unwanted interruptions and large enough to include desk space for writing and for a few open monographs, as well as space for a computer and other machinery needed for the project, and storage space for the necessary books, journals, CD-ROM discs and other supporting material. If the working space is in the library, it should be "lockable" so that the researcher can work there over many weeks.

The library, on the other hand, must furnish suitable space for all the types of activities that go on in a library. In addition to the space needed for resources and staff, this includes space needed for a variety of patron activities involving the use of paper-based resources, micro-stored resources, and electronically stored resources—i.e., space for casual inspection of new journal issues and monographs, reading space, writing space, extended study space, group activity space.

While library problems and problems of scholarly literature are closely entwined and are really two sides of one problem, this study is not written from an overall point of view. Rather, it is written from the patron's point of view, and in particular from the point of view of the researcher in the discipline of the humanities.

The underlying thought of this study is the dependency of humanistic research on library effectiveness. The library is the central institution for research in the humanities because text plays a primary role as research object in this discipline. Even in an age when electronic storage and com-

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munication are beginning to change research techniques and library functions, text, libraries, and humanities research will continue to be entwined in functional and logical association.

Prophecies regarding the library's demise in a "paperless future" notwithstanding, there is hardly a chance that humanity's "paper memory," which defines the library according to the traditional point of view, will be absorbed by an electronic memory. On the contrary, the library's tasks will expand in the future and will probably extend into areas that go beyond the supply of literature. Some new or changed library tasks will result from new techniques for producing scholarly publications (using the term "publications" in its widest sense) and from researchers' increased use of temporary electronics, rather than paper, when drafting research products. The increasing mass of literary production may well force a reluctant library would to become increasingly the judges and interpreters, rather than only the selectors, of the record preserved in written or other form. In the age of reprography, digital records, and e-mail, the disassociation of the physical format from the informational content, especially of some primary publications, will surely impact on the library. Nevertheless, even in the future, the book will continue to be indispensable for scholarly research in the humanities.

The specific problems of supplying literary resources in the humanities evolve from the fact that, at least in its classic disciplines—philosophy, the philologies, and history—the written text is the primary, although not necessarily the only, research object and working tool. Scholarly writing in this field relates as "secondary literature" to a "primary literature" of printed or unprinted texts with which it forms a tenuous continuum that is difficult to control bibliographically.

In the humanities, a text which forms the basis of an investigation may be more or less significant but, because it is part of tradition and subject to reinterpretation, can never become so obsolete that it can be, or should be, eliminated. Works in the field of literature, and even music, are telling examples of this characteristic. Neither quality nor quantity of literature needed is predictable—unlike, for example, in a library attuned to academic instruction. Inherent in research are unpredictable demands for information which would further its direction or lead into more fruitful paths. As a consequence, research requires access to comprehensive collections of material that would include and would preserve the old, the seemingly irrelevant and unimportant. It is the willingness to be prepared for the exceptional case, which is the standard case in research, that distinguishes the research library from the ordinary scholarly library.

This causes, of course, great problems to the research-oriented general library which is asked, in effect, to be willing to grow indefinitely and to meet undreamt-of possible demands which may or may not be made at some unspecified future time. In spite of the great difficulties of meeting such resource requirements, it is quite likely that these problems are being at least ameliorated, if not overcome, by means of coordination, cooperation, and current and future technology.

The acquisitions, storage, service, and financial load is obviously too great for any one library, even a central national library with depository privileges. Over the years, many devices have been created to help libraries share the burden, primarily to share resources.

Cooperative purchasing agreements have existed for over a century, sometimes on a local or regional basis, sometimes on a national basis, like the Farmington Plan. The basic idea is always to acquire as much "relevant" literature as possible by dividing subject responsibility and thereby acquisitions cost, and to rely on ILL to meet some of the patron demands. Most of these plans did not last for more than a few decades. They were probably too tightly connected to a few prime movers and interested administrators and often did not last beyond their administration.

Interlibrary loan has also existed formally for over a century and informally much longer. In recent years, it has been fine-tuned, for example with the U. S. National Interlibrary Loan Code and with efficiently run organizations like the Wisconsin Interlibrary Loan Service or the British Library's Document Supply Centre. Recent technology permits rapid ILL placement via telefax, and commercial enterprise provides a variety of avenues for delivering some of the journal literature. For the researcher, however ungrateful this may seem, ILL is only a second best solution.

Major American academic research libraries have coordinated some of their bibliographic activities and are engaging in cooperative projects designed to preserve decaying resources and to strengthen the group and to improve its services by strengthening the individual library. It is by now axiomatic that no library can operate independently as a sequestered unit; all libraries depend on other libraries to furnish the full range of currently provided effective services.

Technology has permitted duplication of groups of original records in microform and more recently in digital form. Some of the resulting collections are complete copies of the original group, others are selective. All are available for purchasing by interested libraries which have no access to the

originals. They cover a wide range of resources and topics, from government documents to plays and antiquities. These collections, however, are uncoordinated, and while in themselves they are typically very fine products, the researcher has no guarantee that a needed original is in a group which was duplicated, or even that the whole class of originals to which the desired document belongs was copied at all.

The vast majority of possible source materials is, however, not part of a duplicated organized collection. If printed, they are likely to be available in more than one library; if in manuscript format, most likely only in one library. Unfortunately, groups of original records on the same person, movement, topic, or era are often divided among different institutions, sometimes duplicating, sometimes overlapping, but often supplementing each other. Unless a library is willing to lend not only secondary but also primary and unique records for extended periods, the researcher must often go to, or at least borrow from, more than one library to work on one project.

For example, considering only analyzed collections, and although in each of the following examples the main collection is in one institution, manuscript records by and about W. E. B. DuBois and Helen Keller are in at least fifteen libraries, James F. Byrnes in thirteen, Margaret Sanger in twelve, and Georgia O'Keefe (who did not correspond much) in three.[39]

Also, to assure "seamless" coverage of national literary production, and especially of the minor less well known or ephemeral items, it would be helpful if the NCIP were expanded, or a similar project created, to assure preservation on a regional basis. The most important elements in this plan are that the cooperating libraries should contain what was published rather than what seems now to be of interest, and that the assignment of responsibility, while voluntary, be on a coordinated basis rather than on the basis of an independent local decision.

North American librarians and researchers are fortunate indeed that effective national and regional databases and bibliographic tools and guides exist and are being developed to help researchers and librarians. To name only one example each of some major types, OCLC, WISCAT, the *National Union Catalog of Manuscript Collections*, and the North American Collections Inventory Project (NCIP) with its *Online Conspectus*. Given the intricacies of locating resources, even with bibliographic aids that are far better than those of most other countries, it seems inevitable that librarians and libraries will and must continue to exist. Add to this the alertness and robustness of the Association of Research Libraries (ARL) and its manifold activities designed to coordinate, record, and preserve records.

Without fear of being ridiculed, nobody could claim today that art museums are superfluous since postcard copies exist of all important portraits. But even very responsible people take the argument seriously that libraries "with their old books" are superfluous because soon all literature will be supplied via microfilm and cathode ray tube. Very likely the role of libraries will change and even increase thanks to the computer, databases, and networks, but they will continue to exist in the foreseeable future as will the book in codex format. Many libraries are using other media in innovative and supportive ways, such as storing assigned reserve readings in a computer and letting students produce printouts instead of borrowing the actual monograph.[13] But the book's very convenience is a major factor in its continued use as a major visual communication medium. So far, no other invention has surpassed the book as convenient medium for extended leisure reading, and it will most likely continue to be the major source for, and product of, humanities and social sciences research. For economic and time-pressure reasons, most of the older sources which form the basis of much research in the humanities will continue to exist only in codex format, or in micro-format when the original codex is brittle or decayed. Because the humanities demand typically that the researcher absorb a large amount of literature even when recent sources are used, the book's very convenience plays the decisive role in its importance as vehicle and product of research in the humanities.

Like any other profession, librarians must be aware of the human tendency to try to make existing systems better rather than creating new systems when basic premises have changed. But the available evidence points to the continued existence of libraries, of codexes—and of research.

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The undersigned is deeply grateful to Professor Bernhard Fabian for his willingness to allow translation and adaptation of a work that has had wide repercussions in Germany. On the basis of the original work and other initiatives, Professor Fabian was able to obtain funds for two pathbreaking projects to improve the availability and bibliographic control of early German publications: the *Handbuch der historischen Buchbestände in Deutschland* (in progress) is a cooperative publication project, supported by the Volkswagen-Stiftung to provide for the first time a reliable overview of the older printed resources of German research libraries. The acquisitions project, "Sammlung deutscher Drucke 1450-1912," also financed by DM 25 million from the Volkswagen-Stiftung, will enable five German research libraries to complete their already considerable holdings of early German language resources. Responsibility is on a chronological, rather than subject, basis.

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Walt Crawford & Michael Gorman. *Future Libraries: Dreams, Madness, and Reality.* Chicago, IL: American Library Association, 1995, p. 3.

Ibid., p. 181. See also pp. 165-181.

Not everyone agrees that restructuring is even possible. Cf. *Ibid.*, p. 160.

See also Bernhard Fabian (1980). Literaturbedarf und Literaturversorgung der geisteswissenschaftlichen Forschung. *Zeitschrift für Bibliothekswesen und Bibliographie, 27* (2), 85-106.

Somewhat different conditions apply to musicology and aesthetics.

According to Georg Matthiae (1755). Project, wie eine öffentliche Bibliothec in die bequemste gemeinnützige Ordnung zu bringen. *Hannoversche Anzeigen von allerhand Sachen, deren Bekanntmachung dem gemeinen Wesen nöthig und nützlich, 1*, pp. 785-864, which was intended for Göttingen. Leibnitz, naturally, expressed himself in similar fashion.

See also J. M. Ziman. *Public Knowledge: An Essay Concerning the Social Dimension of Science.* Cambridge, England: Cambridge University Press, 1968, pp. 102-126.

Wilhelm Dilthey. *Einleitung in die Geisteswissenschaften* (1883) in *Gesammelte Schriften* (Stuttgart-Göttingen, 1966), I, 24.

J. M. Ziman, *op. cit.*, p. 103.

Adolf von Harnack. Ansprache bei der Übernahme der Generalverwaltung der Königlichen Bibliothek in *Aus der Werkstatt des Vollendeten* (p. 4). Giessen, Germany: Verlag von Alfred Töpelmann, 1930.

As expressed, for example, by Sir Karl Popper, especially in his *The Logic of Scientific Discovery.* New York: Basic Books, 1959. I realize that this view was not always discussed with approbation. For present purposes, a thorough analysis of the several possible views seems, however, dispensable.

As, for example, Ilya Prigogine and Isabelle Stengers, *Dialog mit der Natur: Neue Wege naturwissenschaftlichen Denkens.* Munich, Germany: Piper, 1981.

See in this connection the interesting comments of Rudolf L. Mössbauer, Forschung und Wirtschaftlichkeit. In Franz Letzelter and Heinrich Reinermann (Eds.), *Wissenschaft, Forschung und Rechnungshöfe: Wirtschaftlichkeit und ihre Kontrolle* (pp. 116-124). Berlin, Germany: Duncker & Humblot, 1981.

Cf. Gerhard Frey (1970). Hermeneutische und hypothetisch-deduktive methode. *Zeitschrift für allgemeine Wissenschaftstheorie, I*, 24-40.

Karl J. Weintraub (1980). The humanistic scholar and the library. *Library Quarterly, 50* (1), 29-31.

Sir Karl Popper. *Objective knowledge: An evolutionary approach* (especially the Appendix, pp. 341-361). Oxford, England: Clarendon Press, 1972.

Cf. for example, Bernice T. Eiduson, *Scientists: Their psychological world.* New York: Basic Books, 1962; and J.M. Ziman, *op. cit.*

Heinz Maier-Leibnitz (1976). Humanisierung der Forscherwelt. *Mitteilungen der Deutschen Forschungsgemeinschaft*, Nr. 2-3, p. 8.

Johann Gustav Droysen, *Historik* (pp. 33-34). Hrsg. von Rudolf Hübner (Ed.) Darmstadt ed. Munich, Germany: R. Oldenbourg, 1967.

Cf. for example, Bernward Joerges (1977). Wissenschaftliche Kreativität: Empirische und wissenschaftspraktische Hinweise. *Zeitschrift für allgemeine Wissenschaftstheorie*, 8, 383-404.

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Richard D. Altick. *The art of literary research.* New York: Norton, 1963.

Cf. for example, Richard D. Altick, *The scholar adventurers.* New York: Macmillan, 1950.

B. S. Page, Research in a university library. *Library Association Conference Papers* (London, 1948), p. 86. Cf. in this connection the exposition of Albert Howard Carter, The humanist in the library. In Pierce Butler (Ed.), *The reference function of the library* (pp. 202-217). Chicago, IL: University of Chicago Press, 1943.

[70] G. Jefferson, *Libraries and society*. Cambridge, England: James Clarke & Co. Ltd., 1969, p. 72. See also Carl H. Kraeling, The humanities: Characteristics of the literature, problems of use, and bibliographic organization in the field. In Jesse H. Shera and Margaret E. Egan (Eds.) *Bibliographic Organization* (pp. 109-126). Chicago, IL: University of Chicago Press, 1950.

[71] Ernst Robert Curtius, *Europäische Literatur und lateinisches Mittelalter*. Bern, Switzerland: A. Francke AG, 1948.

[72] *Ibid.*, p. 387.

[73] E. H. Gombrich (1979). Research in the humanities: Ideals and idols. In *Ideals and idols: Essays on values in history and in art* (p. 119). Oxford, England: Phaidon Press Ltd. (Originally in *Daedalus: Journal of the American Academy of Arts and Sciences, 102*, 1973, 1-10.)

[74] Coined by Horace Walpole. Cf. letter to Horace Mann, January 28, 1754. In W. S. Lewis (Ed.) *The Yale Edition of Horace Walpole's Correspondence, 20* (pp. 407-408). New Haven, CT: Yale University Press, 1960.

[75] For example, D. J. Urquhart (1976), National lending / reference libraries or libraries of first resort, *BLL Review, 4* (1), 7-10.

[76] See in this connection Herman H. Fussler and Julian L. Simon, *Patterns in the use of books in large research libraries* (pp. 185-205). Chicago, IL: University of Chicago Library, 1961.

[77] "The ideal library, from the scholar's standpoint, is distinguished by three qualities—convenience, adequacy, and suggestiveness." Douglas Waples (1940), Belgian scholars and their libraries. *Library Quarterly, 10* (2), p. 235.

[78] Richard M. Dougherty and Carol Hughes, *Preferred futures for libraries: A summary of six workshops with university provosts and library directors* (p. 6). Mountain View, CA: Research Libraries Group, 1991, quoted in Crawford and Gorman, *op. cit.*, p. 129.

[79] J. E. Vickery (1977). A note in defence of browsing. *BLL Review, 5*, 110. See also a physician's similar point of view: E. D. Whittle (1977), On browsing. *Ibid.*, pp. 32-33. Cf. also John E. Burchard, How humanists use a library. In Carl E. J. Overhage and R. Joyce Harman (Eds.) *INTREX: Report of a planning conference on information transfer experiments* (pp. 219-223). Cambridge, MA: Massachusetts Institute of Technology Press, 1965.

[80] Cf. Karl Julius Hartmann and Hans Füchsel, *Geschichte der Göttinger Universitätsbibliothek*. Göttingen, Germany: Vandenhoeck & Ruprecht, 1937; and Die Göttinger Universitätsbibliothek im achtzehnten Jahrhundert, *Göttinger Jahrbuch*, 28 (1980), 109-123.

[81] The Göttingen Library was a special type of noncirculating library. While it did circulate books, sometimes even on interlibrary loan, it was regarded in Göttingen itself as an institution that held a single, immediately accessible literature reservoir on the basis of its own holdings and the sometimes considerable private libraries of the professors. Cf. Göttingen als Forschungsbibliothek im achtzehnten Jahrhundert: Plädoyer für eine neue Bibliotheksgeschichte, *Wolfenbüttler Forschungen*, 2 (1977), 209-239.

[82] Christian Gottlob Heyne in the *Göttingischen Gelehrten Anzeigen*, 1810, II, 852.

[83] Hermann Fuchs, Germany: Libraries and information centers. In Allen Kent, Harold Lancour, & Jay Daily (Eds.), *Encyclopedia of library and information science, 9* (p. 432). New York: Marcel Dekker, 1973.

[84] *Ibid.*

[85] Dorothy May Norris, *A history of cataloguing and cataloguing methods 1100-1850: With an introductory survey of ancient times*. London, England: Grafton, 1939.

[86] Conrad Gesner, *Bibliotheca universalis* (Zurich, Switzerland: apud Christophorum, 1545); Gabriel Naudé, *Advis pour dresser une bibliotheque* (Paris, France: F. Targa, 1627); Florian Trefler, *Methodus exhibens per varios indices, et classes subunde, quarum libet librorum, cuius libet bibliothecae*. (1560).

[87] Cf. Paul Ruf, *Säkularisation und Bayerische Staatsbibliothek*. Wiesbaden, Germany: O. Harrassowitz, 1962.

[88] Georg Leyh, *Die deutschen Bibliotheken von der Aufklärung bis zur Gegenwart* (p. 294). Wiesbaden, Germany: O. Harrassowitz, 1956. With its many illustrations, Leyh's presentation furnishes the best overview of this period.

[89] Cf. Günther Franz, Historikerbibliotheken. In Fritz Hodenge (Ed.), *Das Werk der Bücher: Von der Wirksamkeit des Buches in Vergangenheit und Gegenwart: Eine Festschrift für Horst Kliemann* (pp. 271-283). Freiburg, Germany: Verlag Rombach & Co., 1956.

[8]Ferdinand Grassauer (1896). Ziele und Aufgaben des modernen Bibliothekswesen. *Zentralblatt für Bibliothekswesen*, 13, 240.

[9]Cf. in this connection the view of Ernst Foerstemann in *Serapeum* (1845), nos. 15 and 16.

[10]Cf. Ian Willison, The political and cultural context of Panizzi's reform of the British Museum Department of Printed Books as a national research library. In Gerhard Liebers & Peter Vodosek (Eds.), *Bibliotheken im gesellschaftlichen und kulturellen Wandel des 19. Jahrhunderts* (pp 53-73). Wolfenbütteler Schriften zur Geschichte des Buchwesens, 8 (Hamburg, Germany: 1982).

[11]Cf. Report from the select committee on British Museum, 1836. *Reports from Committees*, 10, p. 395; and Edward Miller, *Prince of librarians: The life and times of Antonio Panizzi of the British Museum*. London: Deutsch, 1967.

[12]Arundell Esdaile, *The British Museum Library: A short history and survey* (p. 119). London, England: George Allen & Unwin Ltd., 1948. Cf. also Barbara McCrimmon, *Power, politics and print: The publication of the general catalogue of printed books in the British Museum, 1881-1900*. Hamden, CT: Linnet Books, 1981.

[13]Cf. L. Mortreuil, *La Bibliotheque Nationale, son origine et ses accroissements jusqu'anos jours*. Paris: Champion, 1878; and David C. Mearns, *The story up to now: The Library of Congress, 1800-1946*. Washington, DC: U.S. Government Printing Office, 1947.

[14]We are listing here only three works which give visibility to the tendencies and problems of this sphere: Hans Jürgen Sonnenberger (1977), Forschung als Befund?: Über die Meßbarkeit wissenschaftlicher Forschung, (pp. 301-310), and Christian Flämig (1977), Effizienzkontrolle der Hochschulforschung?, (pp. 311-345). Both in *Bilanz einer Reform. Denkschrift zum 450jährigen Bestehen der Philipps-Universität zu Marburg*, hrs. vom Hochschulverband in Zusammenarbeit mit Hans-Bernd Harder und Ekkehard Kaufmann (Bonn, Germany: Hochschulverband); as well as Thomas Finkenstaedt (1978), Zur Forschungsmessung in den Geisteswissenschaften: Das Beispiel Anglistik. *Ad acta*, 3, pp. 110-164.

[15]Natural scientists are, of course, more conscious of that problem. Cf. for example some comments of Heinz Maier-Leibnitz, Doppelt soviel Spitzenforschung an den deutschen Hochschulen? In *Zwischen Wissenschaft und Politik: Ausgewählte Reden und Aufsätze 1974-1979* (Boppard, 1979), 126-137.

[16]Cf. Josef A. Kruse (1978), Das Heinrich-Heine-Institut in Düsseldorf und seine Archivbestände. *Der Archivar*, 31, 476-480; and Raabe and Ruppelt, *Quellenrepertorium zur neueren deutschen Literaturgeschichte* (Anm. 3), p. 45 (on other collections).

[17]Cf. Adolf von Harnack, Ansprache bei der Übernahme der Generalverwaltung der Königlichen Bibliothek. In Axel von Harnack (Ed.), *Aus der Werkstatt des Vollendeten* (pp. 1-6). Giessen, Germany: Verlag von Alfred Töpelmann, 1930; and P. Schwenke (1912), Deutsche Nationalbibliothek und Königliche Bibliothek. *Zentralblatt für Bibliothekswesen, 29*, 536-542. Cf. also Schwenke, Die Bibliothek als Ganzes in *Fünfzehn Jahre Königliche und Staatsbibliothek* (pp. 1-10). Berlin, Germany: Preußischen Staatsbibliothek, 1921.

[18]Cf. F. Rever (1893), Zur Bibliotheksstatistik. *Zentralblatt für Bibliothekswesen 10*, 180-189; and, for example, the critical overview, signed only by "ck" (1897), Die Leistungen Preußens für seine Bibliotheken und die Bedürfnisse derselben. *Zentralblatt für Bibliothekswesen, 14*, 437-453.

[19]Published in *Zentralblatt für Bibliothekswesen, 3*, (1886), 108-111.

[20]Kirchner, *op. cit.*, Chapter II.

[21]Cf. Ulla Wimmer (1993). Winds of change are blowing hard: German libraries after the unification. *Libri, 43* (4), 309-325.

[22]According to the law of March 31, 1969. Cf. *Die deutsche Bibliothek*. Hrsg. von Rolf-Dieter Saevecke, Ämter und Organisationen der Bundesrepublik Deutschland; 58. Düsseldorf, Germany: Droste, 1980.

[23]Wimmer, *op. cit.*

[24]Cf. Stefan Gergely (1981). Ergebnisse einer Untersuchung über die Effizienz verschiedener Fernleihssysteme. *Fakten, Daten, Zitate*, Heft 4, 4-6.

[25]Cf. *Ibid.*, Chapter III, 3 with regard to the proportion of "older" literature among interlibrary loans.

[26]A brief historical overview is in Hildebert Kirchner, *Bibliotheks- und Dokumentationsrecht* (p.

1788ff). Wiesbaden, Germany: Reichert, 1981. This is also the source of the next citation in the text.

[9] Mary C. Lethbridge and James W. McClung, Library of Congress. In Allen Kent, Harold Lancour, & Jay Daily (Eds.), *Encyclopedia of Library and Information Science, 15* (p. 22). New York: Marcel Dekker, 1975.

[10] For an enlightening description of the efforts of some members of the *Reichstag* to create freedom of the press, and of administrative efforts to limit press freedom in the interest of stability, see Eberhard Naujoks, *Die parlamentarische Entstehung des Reichspressegesetzes in der Bismarckzeit* (1848-74). Beiträge zur Geschichte des Parlamentarismus und der politischen Parteien, Bd. 58. (Düsseldorf, Germany: Droste, 1975). For the text of the law see the *Reichsgesetzblatt*, 1874.

[11] Cf. on this point Werner Krieg, *Landesbibliotheksaufgaben in Nordrhein-Westfalen: Gutachten.* Kulturförderung in Nordrhein-Westfalen; 2. Köln, Germany: Greven, 1979.

[12] Cf. on this point Reinhard Oberschelp (1972), Regionalbibliographien als Aufgabe der Regionalbibliotheken. *Zeitschrift für Bibliothekswesen und Bibliographie, 19*, 75-88; and (presenting likewise basic considerations and a somewhat more recent bibliographic overview) Bertram Haller, Die nordrhein-westfälische Bibliographie: Überlegungen zur Möglichkeit einer Regionalbibliographie für das Land Nordrhein-Westfalen, *Mitteilungsblatt des Verbandes der Bibliotheken des Landes Nordrhein-Westfalen*, N.F. 32 (1982), 107-147.

[13] Cf. on this point Ralph Lansky (1975), Die Pflichtexemplarund Amtsdrucksachenberechtigten Bibliotheken in der Bundesrepublik Deutschland und in Berlin (West). *Zeitschrift für Bibliothekswesen und Bibliographie, 22*, 136-142, 464.

[14] A similar situation exists, incidentally, in the United States, since books that are sent to the Copyright Office for deposit are routinely and permanently transferred to the Library of Congress and are thus available for ordinary library use including interlibrary loan.

[15] The *Deutsche Forschungsgemeinschaft* (German Research Community) was created in 1949 as the *Notgemeinschaft der deutschen Wissenschaft* (Emergency Association for German Scholarship), after the example of an earlier organization that had been created in 1920. It received its current name in 1951. It is an autonomous academic organization financed by the federal and state governments to aid cultural and educational organizations, including universities and their libraries, primarily with financial grants.

[16] F. W. Bateson (Ed.), *Cambridge bibliography of English literature* (Cambridge, England: Cambridge University Press, 1940) is an example. It contributed undoubtedly to the fact that problems of the literary period play a minor role in the history of English literature.

[17] We are using this metaphor in association with the concept of "cultural circles" which played a role when the *Sondersammelgebietssystem* was established. Cf. Hermann Tiemann, Zur Problematik der Sondersammelgebiete. In *Fünfzehn Jahre Bibliotheksarbeit der Deutschen Forschungsgemeinschaft 1949-1964: Ergebnisse und Probleme*, hrsg. von Wieland Schmidt and Dieter Oertel, Zeitschrift für Bibliothekswesen und Bibliographie. Sonderheft. 4 (Frankfurt, 1966), pp. 37-39.

[18] The general criticism is so well known, at least in Germany, that individual examples need not, or should not, be mentioned here.

[19] Part of the "Hanserser Anthropologie" (München, 1977).

[20] The extent to which the lack of bibliographic information influenced Schivelbusch's decision to write in the United States rather than in Germany cannot be decided here. But it is worth noting that Walther Gebhardt in his *Spezialbestände in deutschen Bibliotheken: Bundesrepublik Deutschland einschl.* (Berlin, Germany: De Gruyter, 1977) refers to only two institutions with collections on railroad history: The Library of the German Association for Railroad History (on permanent loan to the Dortmund University Library) and the reference collection in the Traffic Museum in Nuremberg. Neither he nor other standard reference works refer to a third collection which, because of its context, is probably especially helpful, the collection in the Bavarian State Library. I know of only two references to this collection: The library's own guide (without an index entry) and Clemens Köttelwesch's survey, *Das wissenschaftliche Bibliothekswesen in der Bundesrepublik Deutschland* (Frankfurt, Germany: Klostermann, 1980), 2nd ed., Aufl., I,63.

[21] According to H. Paalzow (1905), Einheitliche Katalogisierung und Zettelndruck. *Zentralblatt für Bibliothekswesen, 22*, 408.

[74]Among many relevant works which describe the slow progress of this project, including its flawed, ministry-inspired, initial plan and later revision, are: *Denkschrift betreffend die Kataloge der Preussischen Bibliotheken und ihre Reform durch den Druck des Gesamtkatalogs*, hrsg. von Fritz Milkau (Leipzig, 1925); Karl Dziatzko (1884), Die Centralisation der Kataloge deutscher Bibliotheken. *Zentralblatt für Bibliothekswesen, 1*, 261-267; Fritz Milkau, Centralkataloge und Titeldrucke: Geschichtliche Erörterungen und praktische Vorschläge im Hinblick auf die Herstellung eines Gesamtkatalogs der preussischen wissenschaftlichen Bibliotheken. *Centralblatt für Bibliothekswesen*, Beiheft 20 (Leipzig, 1898); and Christoph Weber, Der Gesamtkatalog der preußischen wissenschaftlichen Bibliotheken, in *Fünfzehn Jahre Königliche und Staatsbibliothek* (Anm. 28), *op. cit.*, pp. 259-272. A fifteenth volume was edited subsequently from galley proofs.

[75]Verfilmung regionaler Zentralkataloge: Überlegungen und Vorschläge der Arbeitsgruppe Retrospektiver Nachweis von Monographien (unpublished), p. 46.

[76]Wimmer, *op. cit.*

[77]The following compartmentalization is modeled after Maurice B. Line (1979), National interlending systems: Existing systems and possible models. *Interlending Review, 7*, 42-46, further elucidated in an internal UNESCO study by Maurice B. Line et al. under the same title (Paris, 1980).

[78]Cf. Graham P. Cornish (1991). The impact of networking on international interlibrary loan and document supply. *Libri, 41* (4), 272-288.

[79]A brief good overview is by Sharon Bonk (1990). Interlibrary loan and document delivery in the United Kingdom. *RQ, 30* (2), 230-240.

[80]Cf. E. J. Friend (1990). National library provision and relationships: Inter-library lending. *Library Association Record, 92* (August), 577-578, 580.

[81]Cf. on this point Stefan Gergely, *op. cit.*

[82]Cf. Cornish, *op. cit.* p. 275.

[83]Cf. John Y. Cole (Ed.). (1981). *In celebration*: The National Union Catalog, Pre-1956 Imprints. Washington, D.C.: Library of Congress; especially the articles by Gordon R. Williams, *The National Union Catalog* and research libraries, (pp. 14-20); Nicolas Barker, Scholarly uses of *The National Union Catalog*: An international perspective (pp. 39-44); and William B. Todd, Scholarly uses of *The National Union Catalog*: A bibliographic saga, (pp. 45-49).

[84]American Library Association Reference and Adult Services Division, Interlibrary Loan Committee, *National interlibrary loan code for the United States (approved February 8, 1994)*. In: R. R. Bowker Co. / Database Publishing Group, *American library directory, 1996-97*, pp. 2521-2523.

[85]One American academic library administrator who examined this manuscript in 1996 commented, "I heard this opinion expressed in a meeting last week."

[86]Hans Limburg (1976). Vergessene Präliminarien? Zur überregionalen Literaturversorgung *Mitteilungen des Verbandes der Bibliotheken des Landes Nordrhein-Westfalen, 26*, 313.

[87]Herbert S. White (1987). Interlibrary loan: An old idea in a new setting. *Library Journal, 112*, (July), 53.

[88]This is especially true in Germany where interlibrary loan is a legal requirement and where it is a major component of furnishing library resources.

[89]Personal information from participants in such discussions.

[90]Cf. Herbert S. White (1988), Interlibrary loan: An old idea in a new setting. *Interlending and Document Supply, 16* (2), 43-45 (reprinted from *Library Journal 112* (July 1987)); and Noeleen P. Martin, Information transfer, scholarly communication, and interlibrary loan: Priorities, conflicts and organizational imperatives. In Mary E. Jackson (Ed.), *Research access through new technology* (pp. 1-21). New York: AMS Press, 1989; and Richard W. Boss and Judy McQueen, *Document delivery in the United States: A report to the Council on Library Resources by Information System Consultants, Inc.* (Washington, D.C.: The Council, 1985).

[91]Bonk, *op. cit.*, p. 239.

[92]Special Report: Resource Sharing. *OCLC Newsletter*, no. 180, 13-26 (July–Aug. 1989). Cited in Bonk, *op. cit.*, p. 238.

[93]Personal information from the head of interlibrary loan services of a C.R. library.

[94]Bonk, *op. cit.*, p. 238.

[95]Bonk, *op. cit.*, pp. 238-239.

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[100]Personal information from the head of interlibrary loan services of a CIC library.

[101]Marilyn M. Roche, *ARL/RLG interlibrary loan cost study: A joint effort by the Association of Research Libraries and the Research Libraries Group*. Washington, D.C.: Association of Research Libraries, 1993, p. 34.

[102]*Ibid.*

[103]There have been recent discussions in the American Library Association among special collections administrators regarding the possible lending of special collections among libraries.

[104] Gisela von Busse, *Struktur und Organisation des wissenschaftlichen Bibliothekswesens in der Bundesrepublik Deutschland: Entwicklungen 1945 bis 1975*. Wiesbaden, Germany: 1977, p. 611.

[105]Sue Kennedy (1987). The role of commercial document delivery services in interlibrary loan. *Interlending & Document Supply, 15* (3), 67-73.

[106]Even the earlier *Library of Congress Catalog of Printed Books* had included some works held by other libraries, but these represented only a minute fraction of the titles available in the later tools.

[107]Cf. Kristin Senecal (1993). Document delivery and interlibrary loan: Time to take the fax machine out of the closet. *Journal of Interlibrary Loan & Information Supply, 3* (4), 43-50.

[108]Bonk, *op. cit.*, pp. 234, 239.

[109]Cf. for example Senecal, *op. cit.*; Kennedy, *op. cit.*; Cornish, *op. cit.*; as well as Denise L. Montgomery (1993). The impact of telefacsimile service upon interlibrary loan in Georgia libraries. *Journal of Interlibrary Loan & Information Supply 3* (3), 57-90; and Jonathan Miller (1993). The electronic library information system as a source of interlibrary loan requests. *Journal of Interlibrary Loan, Document Delivery & Information Supply 4* (2), 17-28.

[110]Cf. Julie M. Still and Frank M. Campbell (1993). Librarian in a box: The use of electronic mail for reference. *Reference Services Review, 21* (1), 15-18.

[111]Cf. for example, Colorado State University Libraries, It's Here! Electronic Access to Interlibrary Loan is as Close as Your Personal Computer... Association of Research Libraries, Office of Management Services, *Interlibrary Loan Trends: Making Access a Reality* (SPEC kit 184), 1992; and "Pilot Project to Provide Faster Access, Borrowing from University of Minnesota Libraries," *FYI* (University of Wisconsin–Madison Libraries), 25 (Dec. 13, 1994).

[112]Personal information from the head of interlibrary loan services of a CIC library.

[113]Cf. Jonathan Miller, *op. cit.*

[114]Cf. Steven J. Schmidt (1992). As a matter of fax (RLG's Ariel fax package). *Journal of Interlibrary Loan & Information Supply, 2* (3), 3-6.

[115]Cf. also Still & Campbell, *op. cit.*

[116]Cf. for example Montgomery, *op. cit.*; and Senecal, *op. cit.*

[117]At the University of Wisconsin—Madison Memorial Library, 75% of outgoing interlibrary loans are "returnables": Books, microfilms, bound newspapers. Commercial suppliers are typically not equipped for this type of material.

[118]Cf. Sue Kennedy, *op. cit.*

[119]FirstSearch Databases. *OCLC Newsletter, 37*, (May–June 1994).

[120]Document ordering debuts on FirstSearch. *OCLC Newsletter, 28*, (January–February, 1993).

[121]UMI and OCLC now offering one-hour document delivery. *OCLC Newsletter, 27*, (January–February, 1994).

[122]Document delivery budgets of $50,000.00 and up per year are not unheard of (information obtained personally).

[123]Cf. also Cornish, *op. cit.*

[124]Cf. also Wilhelm Jacob, Mikroformen als Leihverkehrsmedium. In *Bestände in wissenschaftlichen Bibliotheken: Erschließung und Erhaltung*. Hrsg. von Jürgen Hering und Eberhard Zwink. Zeitschrift für Bibliothekswesen und Bibliographie. Sonderheft. 34 (Frankfurt, 1982), 216-220; this deals still with microfilm and filmstrips. References are also in Jörg Flügge, Zur Integration der Daten-, Text- und Faksimile-Kommunikation im Bibliothekswesen. *ABI-Technik: Zeitschrift für Automation, Bau und Technik im Archiv-, Bibliotheks- und Informationswesen, 1* (1981), 103-108. Also two English studies which, however, are based on different assumptions: Ian R. Willison (1978). The relevance of universal availability of publications to rare and precious books. *IFLA Journal, 4* (2), 158-165; and Maurice B. Line

(1982). The availability of old, rare and precious books: Problems and solutions. *Interlending Review, 10* (4), 119-124.

[12] Josef Goebel, *Schrift, Letter, Mikrokopie* (Mainz, 1940). Goebel viewed the microfiche as a "book record" in analogy to the musical record.

[13] On the considerable postage savings for a library that is heavily engaged in interlibrary loan, see Jacob, *op. cit.*

[14] Cf. Eddy Hogan, CD-ROM: What have we bought, and where is the industry taking us? In Mary Kay Duggan (Ed.), *CD-ROM in the Library: Today and Tomorrow: A Conference Presented by the University of California Berkeley Extension and the School of Library and Information Studies, University of California, Berkeley*, (p. 2). Boston, MA: G. K. Hall, 1990; and William Saffady, *Optical Storage Technology 1992: A State of the Art Review*. Westport, CT: Meckler, 1992, pp. 74-75.

[15] Cf. *Harrod's Librarians' Glossary*, 6th ed. Compiled by Ray Prytherch. Aldershot, Hants, England: Gower, 1987.

[16] Cf. Charles B. Osburn, *Academic Research and Library Resources: Changing Patterns in America*. Westport, CT: Greenwood Press, 1979, pp. 66-89.

[17] An example is Peter Fryer, *Private case—public scandal* (London, England: Secker & Warburg, 1966) about the "private case collection" of the British Library. The general development is sketched in D. W. Krummel (Ed.) (1977), Trends in the scholarly use of library resources. *Library Trends, 25*(4).

[18] Cf. *Conservation et reproduction des manuscrits et imprimés anciens: Colloque international*. Città del Vaticano: Biblioteca apostolica vaticana, 1976.

[19] A good selection of the voluminous earlier literature is Paul N. Banks, *A selective bibliography on the conservation of research library materials*. Chicago, IL: Newberry Library, 1981.

[20] Jeanne Vevrin-Forrer, Le Concept de "Reserve": L'experience de la Bibliotheque Nationale, in the framework of "Celebrazioni in onore di Antonio Panizzi", Rome 1979 (typewritten), and Nicolas Barker (1981), Conservation and preservation: A problem of library management: A British Library view. *Libri, 31*, 193-197.

[21] Crawford and Gorman, *op. cit.* p. 149.

[22] *Statistical Reference Index*. Washington, DC: Congressional Information Service, 1980.

[23] Cf. for example Barbara McFadden Allen (1994), RLG and NCIP: A brief overview and selected bibliography. *Collection Building, 13*(2-3), 11-12; Bonnie J. MacEwan 1989), The North American Inventory Project: A tool for selection, education and communication. *Library Acquisitions—Practice & Theory, 13*(1), 45-50; David Farrell and Jutta Reed-Scott (1989), The North American Collections Inventory Project: Implications for the future of coordinated management of research collections. *Library Resources and Technical Services, 33*(January), 15-28; and for a negative approach, David P. Henige (1987), Epistemological dead end and ergonomic disaster? The North American Collections Inventory Project. *Journal of Academic Librarianship, 13*(September), 209-213.

[24] K. V. S. "With the Ghosts of Gore Hall," Boston Evening Transcript, Nov. 5, 1913.

[25] Cf. J. M. Ziman, *op. cit.*

[26] Cf. David A. Kronick, *A history of scientific and technical periodicals: The origin and development of the scientific and technological press, 1665-1790*. New York: Scarecrow Press, 1962.

[27] Cf. among other works E. N. da C. Andrade (1965), The birth and early days of the *Philosophical Transactions*. *Notes and Records of the Royal Society of London, 20*, 9-27.

[28] Wilhelm Windelband, *Geschichte und Naturwissaenschaft*. Straßburg, France: Heitz, 1904, 3. Aufl., p. 12.

[29] This is naturally based on the assumption that discursiveness and brevity are not opposites.

[30] Crawford and Gorman, *op. cit.*, p. 35.

[31] *Ibid.*, pp. 17-18.

[32] *Scholarly communication: The report of the National Enquiry*. Baltimore, MD: Johns Hopkins University Press, 1979, p. 40. Attempts to obtain more recent figures were unsuccessful. The Library of Congress, the Society for Scholarly Publishing, and any number of likely reference works provided no information. Part of the problem is that the definition of humanities is flexible and influences what will be counted. The general impression at the office which assigns ISSN is that there is an increase in number of journals including humanities journals.

[10] A discussion of the hermeneutic problem in the humanities must here be omitted.

[11] Cf. for example Alan Singleton (1981-1982). The electronic journal and its relatives. *Scholarly Publishing, 13*, 3-18.

[12] Exact figures are virtually unobtainable because of the varying definitions of what constitutes the humanities, because of the great growth rate of electronic journals in all fields, and because many titles are for all practical purposes dormant. The figure of approximately 1,000 e-journals at this stage was arrived at by examining works like: Dru Mogge (Ed.), *Directory of electronic journals, newsletters, and academic discussion lists*. (6th ed.). Washington, DC: Association of Research Libraries, 1996; Louis Rosenfeld, Joseph James, and Martha Vanderkolk. *The Internet compendium: Subject guides to humanities resources*. New York: Neal-Schuman Publishers, Inc., 1995; and Dave and Mary Campbell. *The student's guide to doing research on the Internet*. Reading, MA: Addison-Wesley, 1995. The figure was also suggested by John Dillon, European Humanities Bibliographer at the University of Wisconsin-Madison Memorial Library.

[13] Cf. Maurice B. Line (1982). Redesigning journal articles for on-line viewing. In Philip J. Hills (Ed.), *Trends in information transfer*. London, England: F. Pinter, pp. 31-46.

[14] *Ibid.*, p. 39.

[15] W. L. Saunders (1969). Humanistic institution or information factory? *Journal of Librarianship, 1*, 209.

[16] Cf. *National Union Catalog of Manuscript Collections, 1959/61*. Washington, DC: Library of Congress. Volumes for 1971 to 1980 were examined.

[17] Many students have been Xeroxing assigned readings for decades rather than take the monograph home. The next step was to put the text on the computer to permit students to print it out, as is done, for example, at the University of Wisconsin—Stout in Menomonie.

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